

**LEADERSHIP DEVELOPMENT FOR MOOTW: AN ANALYSIS OF  
TACTICAL LESSONS LEARNED**

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This thesis examines tactical lessons learned from recent military operations other than war (MOOTW) for implications on leadership development for junior leaders in the United States Marine Corps. A doctrinal examination of MOOTW provides the context for the study. The research questions focus on unique leadership capabilities and competencies necessary for junior Marine Corps leaders in the MOOTW environment. The research involved analysis of recent tactical experimental lessons. These tactical lessons learned, coupled with the doctrinal examination, result in MOOTW specific junior leader competencies necessary for MOOTW organizational effectiveness. The results synthesize into three key competency areas: (1) ability to adapt leadership roles to diverse environments, (2) independent decision-making skills for decentralized operations, and (3) ability to develop leadership skills in team members. Theoretical leadership development frameworks are reviewed for insight into improving these junior leader competencies in the Marine Corps. Recommendations include focusing MOOTW training on the characteristics of: (1) highly politicized environment at all levels of command, (2) high ambiguity between combatants and non-combatants, (3) decision-making at the lowest tactical levels in a decentralized environment, (4) development of teams to operate autonomously in this decentralized environment, and (5) reinforcement that tactical decisions by junior leaders have operational and even strategic impact.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Leadership Development for MOOTW, Military Operations Other Than War

**AN OPTIMIZATION OF A NETWORK STRUCTURE FOR A BRIGADE  
LEVEL MILITARY ORGANIZATION**

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Networking is vital for all computer-using organizations. No computer can be thought of as a stand-alone computer. Organizations need to analyze and develop the optimal network structures with consideration of their hierarchical structures. Their needs are to be analyzed as well. The topology and the technology of the network to be developed needs to be considered and then planned.

This thesis presents the different types of network topologies and network technologies. The structure of a brigade is analyzed and different topology combinations for different levels hierarchical structure are analyzed. The flow of the network traffic and network load is optimized using Extend v4, a general purpose simulation tool.

The results show that the optimal network topology for the subject Brigade is Star topology at all levels. The type of technology to be used is Fiber Distributed Data Interface technology.

**DoD KEY TECHNOLOGY AREA:** Command, Control and Communications

**KEYWORDS:** Brigade, Network Topologies (Star, Ring, Bus), Network Technologies (Ethernet, FDDI, ATM), Network Simulation, Extend® Version 4.0

### **AN ANALYSIS OF THE EXPRESS PURCHASE (XP) PROGRAM**

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An automated reconciliation program is a valuable tool in facilitating Department of the Navy (DoN) purchase card operations. The Express Purchase (XP) Program was designated as an interim solution to meet DoN's needs for automating the Purchase Card Program. The Naval Postgraduate School (NPS) at Monterey, California was chosen as one of many beta-test sites to assess XP. Funding for the XP program was terminated, but NPS pursued with the implementation of the system. This thesis analyzes the purchase card process at NPS and NMC San Diego; analyzes the payment methods deployed at each facility; and compares the payment histories of DoN, NPS, and NMC San Diego. Data were obtained by conducting personal interviews, examining Department of Defense (DoD) policies, and reviewing historical payment statistics at NPS, NMC San Diego, and Naval Supply Systems Command (NAVSUP). Fully compatible with XP and in compliance with DoD regulations, NPS employed the transactional payment method, streamlining many of the critical tasks in the program. The XP system proved to be a highly efficient and labor saving tool, resulting in reduced payment delinquencies and expedited payment processing.

**DoD KEY TECHNOLOGY AREA:** Materials, Processes, and Structures

**KEYWORDS:** Government Credit Card, Automated Reconciliation System, Purchase Card

### **STRUCTURED MANAGERIAL APPROACH TO DECISION PROCESSES SHAPING INFORMATION TECHNOLOGY IN NON-IT ORGANIZATIONS**

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This thesis' purpose is to address the inter-disciplinary area of managerial decisions concerning it structures in non-it (information technology) organizations. It is neither intended as a review of general managerial theory, nor aimed at the technical aspects involved. It rather approaches the it support implementation and revising from a practical managerial perspective, attempting to systematize and streamline the decision-making process. Both managerial theory and technological dimension are considered equally important, but called upon only when and at the necessary extent they are required to lay the basis for making decisions.

Between the large knowledge base in the managerial field on one hand, and the newer but dynamic it-related sciences on the other, there is a gray area avoided by both management scholars and computer scientists. The first group sees it as merely a tool, without accepting they have to deal with the transformational effect of technological developments. It is characteristic for the exponents of this school to label it people as "technical" and to discount the specific impact of this particular technology on organizations. The second group, in a continual effort to keep up with the technological boom, is drifting away from the social and organizational issues of it to focus on the technical side, without acknowledging other managerial dimensions than the one centered on the it structures as its object. Both sides tend to focus research in their respective areas, leaving managers of non-it organizations with an inadequate choice between the two approaches. This thesis is aimed towards bridging the resulting inter-disciplinary gap with a flowchart model for the decision process in the analyzed area, using as modules applicable techniques and methods from both managerial and computer science fields, presented in practical operational form.

**DoD KEY TECHNOLOGY AREA:** Command, Control, and Communications

**KEYWORDS:** Information Systems, Management, IT Support, Internet, Networks, Security

**DISSEMINATION AND STORAGE OF TACTICAL UNMANNED  
AERIAL VEHICLE DIGITAL VIDEO IMAGERY AT  
THE ARMY BRIGADE LEVEL**

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The Department of Defense Joint Technical Architecture has mandated a migration from analog to digital technology in the Command, Control, Communication, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) community. The Tactical Unmanned Aerial Vehicle (TUAV) and Tactical Control System (TCS) are two brigade imagery intelligence systems that the Army will field within the next three years to achieve information superiority on the modern digital battlefield. These two systems provide the brigade commander with an imagery collection and processing capability never before deployed under brigade control. The deployment of the Warfighter Information Network (WIN), within three to five years, will ensure that a digital dissemination network is in place to handle the transmission bandwidth requirements of large digital video files.

This thesis examines the storage and dissemination capabilities of this future brigade imagery system. It calculates a minimum digital storage capacity requirement for the TCS Imagery Product Library, analyzes available storage media based on performance, and recommends a high-capacity storage architecture based on modern high technology fault tolerance and performance. A video streaming technique is also recommended that utilizes the digital interconnectivity of the WIN for dissemination of video imagery throughout the brigade.

**DoD KEY TECHNOLOGY AREAS:** Command, Control, and Communications, Computing and Software, Sensors, Other (Information Technology)

**KEYWORDS:** Tactical Unmanned Aerial Vehicle, Tactical Control System, Redundant Array of Independent Disks, Warfighter Information Network, Tactical Internet, Global Broadcast System

**IMPLEMENTING AN INTRANET-BASED PERSONNEL DATA SYSTEM IN COMBAT  
ARM SCHOOLS**

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This thesis presents a model of intranet implementation for a military organization. The model includes the design and implementation of a relational database for a personnel department which is connected to the intranet. The database connectivity from back-end to front-end constructed by Active Server Pages (ASP), enables the users to manipulate the database via their web browsers.

From the technical aspect, in order to achieve a successful and secure intranet implementation, several software and hardware components are reviewed and some are recommended. The intranet pages are built with Microsoft Front Page 98. This prototype will be a first and big step for this organization to initiate a transformation from the traditional manual world to a digitized world. Therefore, it is highly expected that there will be a change problem in the organization. From the management aspect, specific change strategies are suggested to manage change.

**DoD KEY TECHNOLOGY AREA:** Other (Internet, Intranet, Database and Security)

**KEYWORDS:** Intranet, Internet Technology, Information Technology, Database, and Web-Database Connectivity

### **DEVELOPING AND MAINTAINING A USEFUL FINANCIAL MANAGEMENT HANDBOOK FOR DEPARTMENT OF DEFENSE FINANCIAL MANAGERS**

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The 13-week *Financial Management in the Armed Forces* and the two-week *Practical Comptrollership* are two classes offered at the Naval Postgraduate School, Monterey, California. The primary instructional material used for these two courses is the *Practical Comptrollership* handbook. As new financial management directives and guidance from the Office of Management and Budget (OMB), the Department of Defense (DoD), and the Department of the Navy (DoN) are implemented, financial management in the DoN is modified. The purpose of this research was to update the material contained in the *Practical Comptrollership* handbook to reflect changes in financial management policies and practices. This research investigated legislation, OMB, DoD, and DoN directives and budget guidance to incorporate the latest financial management information and processes. This research provides the most up-to-date information currently available to financial managers to assist them in improving the efficiency of financial systems and reduce costs.

**DoD KEY TECHNOLOGY AREA:** Other (Finance)

**KEY WORDS:** Planning, Programming, and Budgeting System (PPBS), Integrated Warfare Architecture (IWAR), Defense Property Accountability System (DPAS), and Program Budget Accounting System (PBAS)

### **DETERMINATION OF THE INDIRECT SUPPORT COSTS FOR THE MORALE, WELFARE, AND RECREATION DEPARTMENT AT THE NAVAL POSTGRADUATE SCHOOL IN PREPARATION FOR AN ACTIVITY-BASED COST ANALYSIS**

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This thesis is about determining the indirect support costs for the Morale, Welfare, and Recreation (MWR) Department at the Naval Postgraduate School (NPS) as a first step in conducting an activity-based cost (ABC) analysis on the organization. All MWRs use a full cost accounting system to track costs, but the problem facing MWR at NPS is that it was unable to determine its indirect support costs (utilities, communications, maintenance, and contracts). This thesis measured and documented indirect costs and also identified activity-based cost drivers for activity pools at MWR. In order to calculate the indirect costs

for MWR, an Excel spreadsheet was developed to extract these costs from the rest of NPS. The indirect support costs for MWR at NPS during the first six months of Fiscal Year 2000 were calculated to be approximately \$155,000. Then, the activities identified by MWR for their ABC study were examined closely, and a suitable cost driver for each activity was recommended.

**DoD KEY TECHNOLOGY AREA:** Other (Financial Management)

**KEYWORDS:** Indirect Support Costs, Indirect Costs, MWR, Activity-based Costing

### **COST-BENEFIT ANALYSIS OF PROVIDING A SPECIAL SUBSISTENCE ALLOWANCE TO MILITARY PERSONNEL WHO QUALIFY FOR FOOD STAMPS**

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Recent reports cite that military Food Stamp Program beneficiaries may range from 6,400 to 20,000. The need for food stamps has been attributed to several factors, one of which is the perceived military "pay gap." Although, significant strides have been made in recent years to improve quality of life for our service men and women and their families, the military pay system tends to lag behind the civilian employment cost growth index. Despite the strong economy currently enjoyed, many of service personnel are struggling to make ends meet.

The analysis compared the costs associated with providing eligible personnel with food stamps to the cost of providing a Special Subsistence Allowance in lieu of food stamps. On the surface, the Federal Government may realize approximately \$7,862,400 savings if the additional subsistence is set at \$180 per beneficiary per month, as posed in Senate legislation. Despite such savings, the Department of Defense is constrained by its compensation system, which uses promotion and pay increases to encourage advancement and longevity as a basis for compensation. The Special Subsistence Allowance in lieu of food stamps could also have devastating financial effects for some while providing a cash bonus for others.

**DoD KEY TECHNOLOGY AREA:** Other (Military Pay)

**KEYWORDS:** Food Stamps, Military Personnel

### **STUDY OF NAVAL OFFICERS' ATTITUDES TOWARD HOMOSEXUALS IN THE MILITARY**

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This study examines the attitudes of Naval officers concerning homosexuals in the military, including trends in attitudes over the past six years and understanding of the "Don't Ask, Don't Tell" policy. The study also compares attitudes of Navy and Marine Corps officers on the topic. A survey, used in two previous studies (1994 and 1996), was distributed to Naval officers at the Naval Postgraduate School (NPS) in October 1999. Hypothesis testing, factor analysis, and regression analysis were used to analyze responses to the survey. The results show that Naval officers are less tolerant of homosexuals in the military than is the general population; Navy officers are more tolerant than Marine officers; Navy women are more tolerant than men of either service; and junior officers tend to be more tolerant than those in higher ranks. Further, officers with casual or no homosexual acquaintances are less tolerant than are those with friends or relatives who are homosexual. A general trend toward increasing tolerance was observed over the six-year period; yet, levels of misunderstanding regarding the details of the military's policy were

as high in 1999 as in earlier years. It is recommended that this study be replicated with a larger military sample.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** "Don't Ask, Don't Tell" Policy, Trend Analysis, Homosexuals in the Military, Navy and Marine Corps Officer Attitudes

### **IMPLEMENTING NEW WORK PROCESSES AT THE ROYAL NORWEGIAN NAVY MATERIAL COMMAND (RNONMC)**

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This thesis focuses on key factors that increase organizational effectiveness at RNoNMC. These factors include implementing work processes throughout the whole organization, implementing information technologies that support work processes, and the use of teamwork across functional areas to solve organizational and technical problems.

Using integrated teams, matched technologies, and tailored work processes in several material programs, RNoNMC observed an increase in quality in the form of quicker results with fewer revisions. Teamwork methods emphasize a systems view towards organizational and technical solutions that integrate the human needs, the technology and the organization.

The RNoNMC can further increase its organizational effectiveness by implementing similar principles to the whole organization. Members of the organization should actively participate in designing and implementing work processes with technologies that support individual, program, and organizational needs. Routine tasks can be automated and time can be more effectively used on solving complex problems. Integrating all parts of the organization in problem solving processes creates an environment of continuous learning.

The recommendations presented derive from a study of change processes in previous programs, socio-technical systems theory, and the expected benefits of information technologies in the work place.

**DoD KEY TECHNOLOGY AREA:** Other (Organizational Change, Information Technology, Systems Engineering)

**KEYWORDS:** Organizational Change, Organizational Effectiveness, Information Technology, Systems Engineering, Teams, Work Processes

### **THE DELAYED ENTRY PROGRAM AND GENERATION Y**

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This thesis studied why recruits leave the Navy Delayed Entry Program (DEP). It employs a two-pronged methodology through analysis of both secondary data and primary data. The secondary data analyzed consist of the Youth Attitude Tracking Study (YATS) and the New Recruit Survey (NRS). The primary data analyzed consisted of a focus group with DEP personnel and a telephone survey of DEP dropouts.

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## THESIS ABSTRACTS

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Emphasis is placed on the attitudinal characteristics of Generation Y in relation to Navy recruits. Recommendations are offered for the Navy DEP program.

**DoD KEY TECHNOLOGY AREA:** Other (Navy Recruiting)

**KEYWORDS:** Delayed Entry Program (DEP), Generation Y, Attrition, Navy Recruiting, Youth Attitude Tracking Study (YATS), New Recruit Survey (NRS)

### **ENTERPRISE RESOURCE PLANNING IN THE NAVAL AVIATION SUPPLY CHAIN AND MAINTENANCE MANAGEMENT PROCESS**

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This thesis examines the current Enterprise Resource Planning (ERP) pilot program in the Naval Aviation Supply Chain and Maintenance Management Process, its implementation plan, and project goals. Legacy information systems maintained by the Naval Supply Systems Command and the Naval Air Systems Command do not effectively share information well. Through an ERP solution, the pilot team proposes to re-engineer Naval Aviation Supply Chain and Maintenance Management Processes and adopt commercial best practices. Private sector and public sector ERP installations are discussed and analyzed for barriers that impede successful ERP implementation. Solutions to Navy-specific barriers are proposed. Recommendations are made for further research.

**DoD KEY TECHNOLOGY AREA:** Other (Naval Aviation Supply, Naval Aviation Maintenance, Information Technology)

**KEYWORDS:** Enterprise Resource Planning, ERP, ERP Implementation Barriers, Naval Aviation Supply Chain and Maintenance, Process Re-Engineering, Commercial Best Practices, Revolution in Business Affairs

### **SURVEY OF DOD PROFIT POLICY AND FURTHER ANALYSIS OF THE ESTIMATION THEORY**

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The current weighted guidelines profit policy within the Department of Defense (DOD) has been the subject of numerous studies over the past four decades to determine its effectiveness within DOD. Many of the studies offer differing results as to the effectiveness of this policy and the measurements used for analysis. The central objective of this study was to conduct a survey of the weighted guidelines profit policy and use event analysis to estimate the size of prizes awarded to defense contractors. To address this issue, a survey of the weighted guidelines profit policy was completed with consideration of an economic approach to the weighted guidelines policy. Analysis of four missile defense systems was conducted to measure the size of prizes awarded for missile contract awards. Findings of the study are limited. The present profit policy within DOD can be improved upon with an economic approach to the weighted guidelines profit policy. However, conclusive findings were not observed for analysis of economic profit within the defense missile industry. This was due to the limited number of contests analyzed in this study.

**DoD KEY TECHNOLOGY AREA:** Other (DoD Profit Policy)

**KEYWORDS:** Economic Profit Policy

**THE ANALYTIC HIERARCHY PROCESS AS A FRAMEWORK FOR SOURCING DECISIONS:  
MANAGEMENT, OPERATIONS, AND MAINTENANCE OF A PBX**

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With the installation of a new Private Branch Exchange (PBX), a telephone switch system, the Naval Postgraduate School is looking for the most effective method of sourcing the management, operations, and maintenance functions of the switch system. This thesis examines other organizations that operate a PBX in a campus-like environment. Using the data from these organizations, this thesis creates a decision framework for the NPS PBX sourcing decision using the Analytic Hierarchy Process (AHP). Separate but linked hierarchies are created for the Management, Operations, and Maintenance functions. The functional criteria in the AHP include Level of Responsiveness, System Updates, Level of Control, Personnel Expertise, and Cost Factors. These hierarchies can be used to make a sourcing decision that reflect the priorities and thresholds of acceptable service set by the decision-maker at NPS. Cost data was not available for other organizations, so full development of the AHP was not possible. Based on the available information, this thesis recommends that NPS should source its PBX management, maintenance and operations initially through a mix of in-house and contractor functions, track costs and other service expectations, and make a second sourcing decision at a later date.

**DoD KEY TECHNOLOGY AREA:** Other (Telecommunications Management)

**KEYWORDS:** PBX, Telephone Switching, AHP, Sourcing Decisions

**FRAMEWORK FOR FINANCIAL RATIO ANALYSIS OF AUDITED FEDERAL  
FINANCIAL REPORTS**

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Federal agencies have traditionally prepared financial reports to monitor and report the obligation and expenditure of federal funding. With the passage of the Chief Financial Officers Act of 1990, Congress called for the production of financial statements that fully disclose a federal entity's financial position and results of operations. The disclosure of this type of information, it was believed, would enable decision-makers to understand the financial implications of budgetary, policy and program issues and provide an analytical tool for obtaining a deeper understanding of a federal agency's financial condition and operations. The objective of this thesis was to develop a framework for financial ratio analysis of audited federal financial reports to assist in analyzing federal agencies. To accomplish the objective, this thesis identified the theoretical and historical basis of financial ratio analysis, identified the existing financial reporting models and ratio analysis frameworks in other sectors of the economy, and identified the financial accounting and reporting environment unique to the federal government. Based upon this archival research, this thesis developed a framework for financial ratio analysis of audited federal financial reports framed around the users and objectives of federal financial reporting. The users of audited federal financial reports can use this framework to assist in agency analysis, assist in decision-making processes, and assist in achieving the objectives of federal financial reporting.



**DoD KEY TECHNOLOGY AREA:** Other (Financial Management)

**KEYWORDS:** Ratios, Financial Ratios, Financial Ratio Analysis, Financial Statements, Financial Statement Analysis, Federal Financial Reports, Financial Reporting, Chief Financial Officers Act

**AN ANALYSIS OF THE CREDIT CARD PROGRAM USING PROCESS INNOVATION**

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Since the early 1990s, acquisition reform has been the focus of DoD acquisition and has affected nearly every process in the acquisition cycle. The implementation of the Federal Acquisition and Streamlining Act has placed more emphasis on allowing contracting officers to apply sound business judgment instead of blindly following detailed regulations and procedures. This goes a long way toward improving and streamlining the contracting process.

One of the key reform initiatives in streamlining the process is the implementation of the Government-wide credit card program. The focus of this thesis is to look at the benefits the Marine Corps has observed since the implementation of the credit card, examine the savings and determine if the process has met its objective of making the acquisition cycle more efficient. The thesis also looks at current processes and develops three redesign alternatives that offer good potential to further streamline the process. The thesis also suggests mechanisms for implementing these process redesigns and generalizes as to how they can be applied to other DoD organizations.

**DoD KEY TECHNOLOGY AREA:** Other (Contracting)

**KEYWORDS:** Purchase Card Program, Process Innovation, Micropurchases

**MEDICARE SUBVENTION: A CASE ANALYSIS OF REIMBURSEMENT ISSUES AFFECTING**

**TRICARE SENIOR PRIME AT NAVAL MEDICAL CENTER, SAN DIEGO**

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Medicare-eligible military beneficiaries have experienced difficulty accessing the Military Health System. To help alleviate this problem, a three-year demonstration project known as Medicare Subvention has been implemented, creating a Department of Defense Health Maintenance Organization called TRICARE Senior Prime (TSP). This research determined the financial impact of TSP at Naval Medical Center, San Diego (NMCSD). The financial analysis includes an examination of inpatient and outpatient costs and revenues for Fiscal Year (FY) 1999. The results of this research show that TSP indirectly caused a net reduction in operating costs at NMCSD in FY 1999 of \$1.5 million or one percent of the operating budget. The program caused revenues to decline by causing a 20 percent reduction in admissions for non-TSP beneficiaries with other health insurance. Proportionally larger cost reductions resulted from this decrease in non-TSP admissions that outweighed increases in TSP admissions.

**DoD KEY TECHNOLOGY AREA:** Other (Healthcare)

**KEYWORDS:** Medicare Subvention, TRICARE Senior Prime

**HOW THE NAVAL AVIATION MAINTENANCE PROGRAM (NAMP) AT THE  
INTERMEDIATE LEVEL CAN BECOME ISO 9000 QUALITY  
MANAGEMENT SYSTEM COMPLIANT**

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**Kenneth J. Euske, Department of Systems Management**

This thesis examines the similarities and differences between the Naval Aviation Maintenance Program (NAMP) and International Standards Organization (ISO) 9000 Quality Management Systems (QMS), and what changes must be done to bring the NAMP to ISO 9000 standards. The NAMP is naval aviation's overall guiding document that outlines command, administrative, and management relationships, and assigns maintenance policy and procedure responsibilities to the respective individuals for management. ISO 9000 is a series of international standards establishing requirements and guidelines for maintaining an organization's quality system, which focuses on prevention rather than detection. This thesis will first examine ISO 9000 QMS aspects in relation to organizational and intermediate maintenance actions. Next, a plan for implementing the ISO 9000 QMS in naval aviation's organizational and intermediate maintenance activities is developed. Specifically, process maps are described for QM documentation, policies, and procedures under both the NAMP and ISO 9000, and then compared and contrasted. Then, a sample ISO 9000 quality manual for the Tool Control Program (TCP) on an intermediate maintenance activity, including how this manual can satisfy the 20 tenets of the ISO 9000 QMS is developed. Finally, recommended changes to NAMP QM procedures, processes, and policies are provided along with expected benefits naval aviation will receive if ISO 9000 is implemented.

**DoD KEY TECHNOLOGY AREA:** Other (Material Logistics Support Management)

**KEYWORDS:** Quality Management Systems, Change Implementation, DoD Reform Initiatives, ISO 9000 Certification Process, Naval Aviation Maintenance

**AN ANALYSIS OF THE NATO PROCUREMENT SYSTEM**

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Since the end of the "Cold War" and the disintegration of the Warsaw Pact, NATO alliances have collectively had to change their procurement philosophies. NATO procurement (as it applies to the 19 nations) has met with decreased military funding due to changes in the military environment. Much of the emphasis on procurement today revolves around multinational efforts and is marked by global standardization. However, NATO's organizational procuring entities have changed very little since the end of the Cold War. By assessing the practices of three of the procuring entities, recommendations can be made regarding procurement policies and procedures and principal problem areas.

**DoD KEY TECHNOLOGY AREA:** Other (Acquisition and Contracting)

**KEYWORDS:** NATO, ACE, NC3A, NAMSA

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## THESIS ABSTRACTS

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### **A DECISION-MAKING MODEL UTILIZING INFORMATION TECHNOLOGY: COMBINING THE FEATURES OF THE INTERNET, PUBLIC PARTICIPATION, AND PROVEN DECISION-MAKING METHODS**

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This thesis research combines several proven methods by which public participation can be used more effectively in a government decision-making process. The research involved fulfilling three primary purposes. First, the research provides a flexible user-friendly internet-based platform, whereby the knowledge level of a disparate group of stakeholders can be improved with respect to a complex technical subject. Second, the research demonstrates a method by which stakeholder consensus is derived. Third, the research exhibits a method by which public values are aggregated, whatever the level of consensus; the data is then provided to the government for use in a decision-making model.

**DoD KEY TECHNOLOGY AREAS:** Computing and Software, Environmental Quality, Human Systems Interface, Other (Decision Analysis, Decision-Making)

**KEYWORDS:** Web Technology, Internet, Information Technology, Public Participation, Decision-Making, Value Tree Analysis, Multi-Attribute Utility Theory, Analytical Hierarchy Process, Delphi Method, Median Ranking Method, Hungarian Method, Rank Correlation and Aggregation

### **AN ANALYSIS OF PROTESTS OF CONTRACTS AWARDED THE BEST VALUE TRADE-OFF PROCESS FROM JANUARY 1998 THROUGH DECEMBER 1999**

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**Master of Science in Management-June 2000**

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The purpose of this thesis is to analyze protests of contract awards brought before the Comptroller General, General Accounting Office from January 1998 through December 1999 as a means to identify areas of possible improvement among Federal contracting agencies. Specific emphasis is on the underlying causes of protest sustainment. This thesis distills eight sustaining elements from the GAO findings. Finally, this thesis offers recommendations to Federal contracting agencies in an effort to help mitigate the risk of a sustainable contract award protest.

**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training, Other (Acquisition and Contracting)

**KEYWORDS:** Contract Protests, Trade-off Process, Best Value

**DESIGN, IMPLEMENTATION, AND ANALYSIS OF THE PERSONNEL, OPERATIONS,  
EQUIPMENT, AND TRAINING (POET) DATABASE AND APPLICATION  
PROGRAM FOR THE TURKISH NAVY FRIGATES**

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**Master of Science in Management-March 2000**

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The Turkish Navy frigates have a challenging mission, which encompasses tactical, operational and administrative tasks. Lacking an automated information infrastructure hinders the ships' ability to efficiently perform the administrative activities, to generate the required reports quickly and to make effective decisions based on this information.

The objective of this thesis is to design and implement the Personnel, Operations, Equipment, and Training (POET) Database and Application Program for the Turkish Navy frigates and to analyze the potential benefits that will be obtained by using this system. The POET database system will provide the Turkish Navy frigates with an automated information system that will support the administrative activities, release manpower to perform other duties and reduce the productive power loss by increasing the availability, accuracy, and consistency of the data.

The thesis covers the analysis of requirements, conceptual database design using Semantic Data Model, logical database design on Microsoft Access DBMS, and implementation of the application program using Java and JDBC API. The result of this study is a functional application that will eliminate most of the current problems onboard the frigates and result in considerable savings of personnel power and time while providing the required information to the command quickly.

**DoD KEY TECHNOLOGY AREAS:** Computing and Software, Manpower, Personnel, and Training

**KEYWORDS:** Database, Relational Database System, Semantic Data Model, Java, JDBC, System Maintenance, Design, Implementation and Analysis of Information Systems

**COST AND OPERATIONAL EFFECTIVENESS ANALYSIS OF ALTERNATIVE FORCE  
STRUCTURES FOR FULFILLMENT OF THE UNITED STATES MARINE CORPS  
OPERATIONAL SUPPORT AIRLIFT AND SEARCH AND RESCUE MISSIONS**

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**William R. Gates, Department of Systems Management**

This thesis provides a preliminary cost and operational effectiveness analysis of alternative force structures for the United States Marine Corps operational support airlift and search and rescue missions. The four alternative force structures include C-12s and CH-46Es, C-35s and CH-46Es and HV-609s. Lifecycle cost analysis of the alternative force structures using Crystal Ball forecasting provides a 90% upper confidence level lifecycle cost estimate that identifies a mix of C-35s for operational support airlift and CH-46Es for search and rescue as the least expensive alternative. Operational effectiveness analysis provides a measure of overall utility for each of the four alternative force structures based on five measures of effectiveness. The measures of effectiveness examined are air travel time, total travel time, landing site requirements, range versus time on station, and payload versus range. Analytical hierarchy process rankings indicate that the HV-609 is the preferred alternative considering these measures of effectiveness. Analysis of cost versus operational effectiveness identifies the HV-609 as the most cost and operationally effective alternative for fulfilling the Marine Corps operational support airlift and search and rescue missions.

**DoD KEY TECHNOLOGY AREA:** Air Vehicles

**KEYWORDS:** Tiltrotor, Operational Support Airlift (OSA), Search and Rescue (SAR), Cost and Operational Effectiveness Analysis (COEA), C-12, C-35, CH-46E, HV-609

**AN ANALYSIS OF RETURN ON INVESTMENT OPTIONS  
FOR THE USMC DISTANCE LEARNING PROGRAM**

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A study was conducted to examine various aspects of Distance Learning (DL) applications currently under review by the Marine Corps, and determine whether these programs, if initiated, provide a positive Return on Investment (ROI). The objective was to determine how DL applications may be applied in the most advantageous manner, to increase the overall efficiency of current training programs from both a monetary and quality perspective. Specifically, DL applications were evaluated for pertinence to the four categories of learners found within the organizational hierarchy. To accomplish this objective, information was collected from the DL Branch, Training & Education Division, Headquarters, United States Marine Corps, as well as from faculty and staff at the Marine Corps Communications and Electronics Course, Marine Corps Air Ground Combat Center, 29 Palms, California. Results were favorable with a positive ROI being determined from the stated assumptions. Other findings included that the most beneficial application of DL technology should be primarily toward advanced level training with possible considerations for Marines awaiting training, and that due to increased instructional requirements, the timesavings attributed to advances in training technology should not automatically result in reductions in formal course curricula. Simply stated, DL technologies provide great value added potential to enhance knowledge transfer in today's dynamic and fluid training environment, but should be viewed primarily as a complement to, rather than replacement for, traditional instructional methods.

**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training, Other (Distance Learning)

**KEYWORDS:** Systems Management, Distance Learning, Return on Investment

**TOWARDS RE-ENGINEERING THE UNITED STATES NAVY ENLISTED MANPOWER AND  
PERSONNEL SYSTEMS - A DATA WAREHOUSE APPROACH**

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Historically, stovepiped information systems have been developed to meet the needs of individual departments or users. Over time, attempts to increase the usefulness of these systems often involved adding layers of additional programming and data structures, resulting in complex and difficult to maintain legacy-based systems. The United States Navy enlisted personnel and manpower database system epitomizes this problem. The current system consists of several mainframe systems and a multitude of front-end systems that often require personnel managers to perform manual data extraction to execute routine activities. To illustrate the problem, focus is on the Navy Enlisted Classification (NEC)

reutilization, a critical aspect of the personnel assignment process. First, a series of contemporary database topics that form the basis for solving the problems associated with file-based legacy databases is presented. Second, details are provided of the make-up and problems associated with the current system. Third, a prototype relational data mart is developed to prove the value of a data warehouse/data mart driven relational system. Fourth, using the prototype relational data mart as a source system, a contemporary OLAP application is used to prove the effectiveness of using a multi-dimensional data tool to analyze NEC reutilization. Finally, issues involving data quality and their impact on a data warehouse solution to integrating legacy systems are discussed.

**DoD KEY TECHNOLOGY AREA:** Computing and Software

**KEYWORDS:** OLAP, Data Warehouse, Enterprise Data Warehouse, Data Mart, Legacy System, Navy Enlisted Classification, Enlisted Personnel System, Enlisted Manpower System

**ACCOMPLISHING THE MISSION OF NATIONAL MISSILE  
DEFENSE WITH CURRENT TECHNOLOGY**

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David F. Matthews, Department of Systems Management**

The purpose of this thesis is to evaluate the Ballistic Missile Defense Organization's proposals for a National Missile Defense (NMD). This thesis compares the costs of missile systems that will provide a NMD, such as Patriot Advanced Capability – 3 (PAC-3), Navy Area (SM-2 Block IVA), Theater High Altitude Area Defense (THAAD), Navy Theater-Wide (SM-3), and the Ground-Based Interceptor (GBI). The data gathered for this thesis included unclassified performance data and the gross cost data relevant to the above systems. Interviews were conducted with personnel that are expert in U.S. Navy SPY radar and Aegis combat systems, and have knowledge of SM-2 Block IVA and SM-3 missile systems.

This thesis concludes that there is redundancy in the development paths to creating a single, centrally located Ground-Based Interceptor and radar (GBI/GBR) site. By eliminating or amending the 1972 ABM Treaty to allow a multi-site NMD, a Coastal NMD could be constructed in the near future, using technology that is available today and missiles that will be placed on ships starting in 2002. As development of SM-3 and THAAD missile technology continues, these systems could be used to implement a multi-site NMD far sooner than a GBI could.

**DoD KEY TECHNOLOGY AREA:** Other (National Missile Defense, Ballistic Missile Defense)

**KEYWORDS:** National, Theater, Area, Missile, Defense, THAAD, SM-3, SM-2, PAC-3

**ANALYSIS OF THE ONGOING PROCESS FOR PRIVATIZING UTILITY  
SYSTEMS IN THE NAVY**

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In December 1997, the Deputy Secretary of Defense issued Defense Reform Initiative Directive #9 directing the Military Departments to develop a plan for privatizing all utility systems except those needed for unique security reasons or when privatization is uneconomical. The utilities privatization program is designed to get DoD out of the business of owning, operating and maintaining utility systems.

DoD consumes 70 percent of all the energy consumed by the federal government. This costs DoD nearly \$6 billion a year, with \$2.4 billion of that in infrastructure maintenance. Privatization of DoD utility systems can generate an estimated savings of \$327 million annually in reduced infrastructure costs. These savings can be reallocated to DoD's core competencies: warfighting and warfighting support.

This thesis analyzed two case studies to help identify emerging problems facing utilities privatization in the Navy and determine their impact to the ongoing implementation process. Three major problems were identified: (1) variance in determination of Fair Market Value, (2) variance in economic analyses, and (3) applicability of State Utility Commissions' authority over utility systems located on DoD installations. The thesis concluded by making recommendations intended to improve the process for privatizing utility systems in the Navy.

**DoD KEY TECHNOLOGY AREA:** Other (Shore Installation Management)

**KEYWORDS:** Utilities Privatization, Privatizing Utility Systems, Defense Reform Initiative, Defense Reform Initiative Directive

### **THE DECISION TO ALLOW MILITARY WOMEN INTO COMBAT POSITIONS: A STUDY IN POLICY AND POLITICS**

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Until 1991, combat aviation exclusion laws barred women in the Navy, Marine Corps, and Air Force from being assigned to aviation squadrons that flew or trained for combat missions. The Congressional decision to rescind such laws and, subsequently, the laws banning women from combat ships in the Navy was of great significance in the history of the United States military and the nation as a whole. Studying the Congressional proceedings that allowed military women to assume such roles leads to a more in-depth understanding of how difficult or sensitive decisions have been made in the past and will likely be made in the future. The focus of this thesis is two-fold. First, the thesis reviews the history of women in combat and the major issues involved. Second, through research and interviews with key individuals, it examines the Congressional decision and resulting actions. Interviews with a former member of Congress, legislative aides, high-ranking Navy and Army leaders, Department of Defense officials, and women's rights activists revealed certain consistencies in perceptions concerning the circumstances and events that led to removal of the laws excluding military women from combat. Interviewees generally agreed that exclusionary laws were lifted in 1991 due to political and societal influences, the experiences of women in Operations Desert Shield and Desert Storm, successful lobbying by activists, and legislative procedure. Recommendations are offered for future research.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Women in Combat, Women in the Military

### **LOGISTICS SUPPORT REQUIREMENTS: A CASE ANALYSIS OF THE TACTICAL QUIET GENERATOR**

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Recent trends in technological advances have resulted in the commercial sector leading the military sector in many areas of technological development. As a result, there are many readily available components and

end items that can be designed, integrated and assembled into military hardware that will satisfy the stringent requirements of the tactical battlefield. Use of commercial or non-developmental items compresses the overall acquisition time, but currently reduces time available for logistics planning and preparation. The result is new systems being fielded without the necessary support structure in place. Proper use of warranties, Contractor Logistics Support, and Prime Vendor support might improve equipment readiness and ensure the gap is bridged between a newly fielded system and a mature supply support system for optimum benefit to the Department of Defense (DoD) and the taxpayer. Good logistics support planning in the early phases of the acquisition process will reduce the life cycle costs and increase operational availability. Applying these approaches to the Tactical Quiet Generator (TQG) would seem to provide significant benefit and offer other acquisition and logistics professionals valuable insights into the planning of future support arrangements.

**DoD KEY TECHNOLOGY AREA:** Other (Logistics and Acquisition)

**KEYWORDS:** Logistic Support, Defense Acquisition, Program Management, Contracting, Acquisition Reform

### **EVALUATION OF THE SPACE AND NAVAL WARFARE SYSTEMS COMMAND (SPAWAR) COST AND PERFORMANCE MEASUREMENT**

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Master of Science in Management-December 1999**

**and**

**Drew G. Flavell-Lieutenant Commander, United States Naval Reserve  
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**Advisors: Lawrence R. Jones, Department of Systems Management  
Jerry L. McCaffery, Department of Systems Management**

This thesis examines the Cost and Performance Measurements within four Program Directorates at the Space and Naval Warfare Systems Command (SPAWAR). SPAWAR is the Navy's full-spectrum research, development, test and evaluation, engineering and fleet support center for Command, Control and Communications Systems, Ocean Surveillance Systems and the integration of those systems that overarch multiplatforms. In the era of lean military budgets, public and congressional demands for improved performance within government and performance based budgeting, Commands must justify their budgets and resource allocation relating to costs and outputs. How can commands determine the efficiency of their organizations without accurate cost and output measurement? The primary focus of this thesis is to describe the cost and performance measurement systems applied in the SPAWAR Program Directorates to determine what types of cost, scheduling and performance information they provide for the command. The components of the Program Directorates, the Program Manager Warfare, use a wide variety of locally designed computer programs and tracking systems to measure cost, scheduling and performance. This thesis forms a foundation for further analysis on cost and performance measurement in SPAWAR.

**DoD KEY TECHNOLOGY AREA:** Other (Performance Measurement, Cost Measurement)

**KEYWORDS:** Performance Measurement, Cost Measurement, Acquisition Program Measurement



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## THESIS ABSTRACTS

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### **PLANNING, DESIGNING AND IMPLEMENTING A NETWORK FOR THE NAVAL RESERVE**

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This thesis focuses on an analysis of the technology and steps involved in planning, designing and implementing a network for the Naval Reserve Force. The Naval Reserve is undergoing a multi-year program that will dramatically upgrade the Naval Reserve Network. The upgrades are needed to establish an effective Wide Area Network that is compliant with Department of the Navy Chief Information Officer's information technology standards guidance. Through the study, the challenges to implementing an effective network were identified as well as recommended strategies for successfully implementing the network.

The thesis includes a requirements analysis of a typical Naval Reserve Center and a recommendation for a standardized Reserve Center Local Area Network architecture. An overall standard network architecture is needed to improve system performance and interoperability. In addition, the thesis studies how to best stimulate the changes to business practices that will be required to ensure that the network will not be underutilized. The recommendations and information presented will benefit the Naval Reserve Force in their ongoing efforts to implement an effective Wide Area Network and to standardize their Information Technology infrastructure.

**DoD KEY TECHNOLOGY AREA:** Computing and Software

**KEYWORDS:** Wide Area Network, Local Area Network, WAN, LAN, Network Design, Media, Topology, Hub, Router, Managing Planned Change

### **A STATISTICAL ANALYSIS OF RETENTION IN THE SURFACE WARFARE COMMUNITY**

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This thesis develops multivariate models to estimate the determinants of retention in the Surface Warfare community to the Lieutenant Commander (O-4) promotion board. Using data from the Navy Officer Master File and the Navy Officer Loss File, logit models are specified to analyze the probability of Surface Warfare Officer (SWO) retention to the O-4 board, transfer from the SWO community prior to the O-4 board, and resignation from the Navy prior to the O-4 board. The probabilities are modeled as functions of background and demographics, early Navy experience, and combinations thereof. The findings reveal that serving initially in a cruiser or destroyer, having children, being older at commissioning and being recommended for accelerated promotion more often as an O-1 or O-2 are all positive indicators of Surface Warfare community retention. Having a higher undergraduate GPA, majoring in engineering as an undergraduate, and being commissioned via Officer Candidate School are all negatively associated with Surface Navy retention. Based upon the research results, recommendations are made for the Navy to investigate alternative means of ranking year groups for service and ship selection.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Surface Warfare, Retention

### **OBSTACLES TO DEMOCRATIZATION: THE ROLE OF CIVIL SOCIETIES**

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**Anna Simons, Special Operations Academic Group**

Objective of this research is to develop a set of criteria that might be used to highlight the obstacles with which many nations have had to deal after they started to restore, or build democracy. The research is focused on historical conditions that shaped the development of civil societies in four countries (Czech Republic, Poland, Botswana and Kenya) before these countries decided to restore or build their democracies. The study of these four countries from different parts of the world shows essential obstacles that, to some extent, shaped the process of the transition and could be taken into account to predict its length, success, or failure. These pre-existing obstacles are sometimes overlooked or underestimated at the beginning of the transformation, and, consequently they could cause not only the failure of the democratic process, but also increasing tension in society.

**DoD KEY TECHNOLOGY AREA:** Other (Democratization, Civic Society)

**KEYWORDS:** Civil Society, Democracy, NGOs

### **A DECISION-MAKING MODEL UTILIZING INFORMATION TECHNOLOGY: COMBINING THE FEATURES OF THE INTERNET, PUBLIC PARTICIPATION, AND PROVEN DECISION-MAKING METHODS**

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**and**

**Timika L. Burnett**-Lieutenant, United States Navy

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**Matthew S. Feely, Information Systems Academic Group**

This thesis research combines several proven methods by which public participation can be used more effectively in a government decision-making process. The research involved fulfills three primary purposes. First, the research provides a flexible user-friendly internet-based platform, whereby the knowledge level of a disparate group of stakeholders can be improved with respect to a complex technical subject. Second, the research demonstrates a method by which stakeholder consensus is derived. Third, the research exhibits a method by which public values are aggregated, whatever the level of consensus; the data is then provided to the government for use in a decision-making model.

**DoD KEY TECHNOLOGY AREAS:** Computing and Software, Environmental Quality, Human Systems Interface, Other (Decision Analysis, Decision-Making)

**KEYWORDS:** Web Technology, Internet, Information Technology, Public Participation, Decision-Making, Value Tree Analysis, Multi-Attribute Utility Theory, Analytical Hierarchy Process, Delphi Method, Median Ranking Method, Hungarian Method, Rank Correlation and Aggregation

### **AN EXPERT SYSTEM FOR REWARD SYSTEMS DESIGN**

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**Master of Science in Information Technology Management-September 2000**

**Advisors: Erik Jansen, Department of Systems Management**

**Mark E. Nissen, Department of Systems Management**

Today's business environment is a highly competitive marketplace. In this competition, organizations distribute numerous rewards to motivate, attract and retain employees, such as pay, fringe benefits and promotions. However, not all managers have the necessary knowledge and expertise to effectively decide and structure reward systems.

This thesis presents an expert system to assist managers with designing the most appropriate reward system in their organizations. The system queries the user about the organization's goals, structure, culture, technology and its management's vision. This information is then filtered through decision matrixes in the knowledge base to generate the results along with an explanation and an estimated accuracy factor. The system was designed and programmed using Microsoft Visual Basic 6.0. The decision tables in the knowledge base were designed and structured using a Microsoft Access database.

The results show that similar knowledge base expert systems could be designed and programmed to assist managers for other purposes in organizations.

**DoD KEY TECHNOLOGY AREAS:** Computing and Software, Manpower, Personnel, and Training

**KEYWORDS:** Artificial Intelligence, Expert Systems, Visual Basic, Organizations, Reward Systems

### **KNOWLEDGE MANAGEMENT INNOVATION OF THE COAST GUARD**

#### **COUNTERNARCOTICS DEPLOYMENT PROCESS**

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**Kishore C. Sengupta, Information Systems Academic Group**

The major contribution this thesis provides is the application of a "break through" knowledge management system design methodology to a knowledge intensive military work process. Specifically, the methodology was used to develop a knowledge management system (KMS) for the United States Coast Guard (USCG) Pacific Area Tactical Law Enforcement Team (PACAREA TACLET). The focus was on applying knowledge management innovation using the above mentioned methodology to the Law Enforcement Detachment (LEDET) Counternarcotic (CN) Deployment Process, which depends on the combined experience and expertise of all members of the detachment in order for the process to be completed successfully. This thesis provides evidence that this methodology, which was developed by Nissen, Sengupta, and Kamel, is robust enough to be used in civilian knowledge work processes, as well as military environments.

The knowledge management system design process used acknowledges that the knowledge transfer required for the primary process to succeed is dependent upon other processes that do not directly relate to it. These processes are referred to as vertical-flow processes. Knowledge management innovation of the CN Deployment process is focused on the vertical-flow processes because the knowledge required for a LEDET to meet the horizontal process goal is dependent on the efficiency of the identified vertical-flow processes

**DoD KEY TECHNOLOGY AREAS:** Command, Control, and Communications, Manpower, Personnel, and Training

**KEYWORDS:** Coast Guard, Tactical Law Enforcement Team, Law Enforcement Detachment, Maritime Law Enforcement, Knowledge Management, Information Technology, Counternarcotics

### **COMPARISON OF THE DEFENSE ACQUISITION SYSTEMS OF CANADA AND THE UNITED STATES OF AMERICA**

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CDR David A. Smith, USN, Department of Systems Management**

Both Canada and the U.S. have comprehensive internal organizational structures devoted to carrying out federal acquisition in support of their defense departments. This study was conducted as a macro-level comparison to identify policies and procedures that contribute to the effectiveness of the respective acquisition systems. The researcher found many similarities and differences in political and legal influences, objectives and goals, organizational structures, and selected acquisition processes of the two countries. The differences in acquisition processes were partially attributed to distinct political and legal influences, variations in federal acquisition objectives and goals, and the relative differences in size of the two country's defense departments. Recommendations for Canada included: publication of a revised federal acquisition vision and associated goals, review of published acquisition procedures, and increased federal leadership in acquisition reform.

**DoD KEY TECHNOLOGY AREA:** Other (Acquisition)

**KEYWORDS:** Defense Acquisition, Canada, Federal Acquisition Process, Acquisition Reform, Contracting, Procurement

### **EVALUATION OF THE SPACE AND NAVAL WARFARE SYSTEMS COMMAND (SPAWAR) COST AND PERFORMANCE MEASUREMENTS**

**Drew G. Flavell-Lieutenant Commander, United States Naval Reserve  
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**Timothy E. Dorwin-Lieutenant, United States Naval Reserve  
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This thesis examines the Cost and Performance Measurements within four Program Directorates at the Space and Naval Warfare Systems Command (SPAWAR). SPAWAR is the Navy's full-spectrum research, development, test and evaluation, engineering and fleet support center for Command, Control and Communications Systems, Ocean Surveillance Systems and the integration of those systems that overarch multiplatforms. In the era of lean military budgets, public and congressional demands for improved performance within government and performance based budgeting, Commands must justify their budgets and resource allocation relating to costs and outputs. How can commands determine the efficiency of their organizations without accurate cost and output measurement? The primary focus of this thesis is to describe the cost and performance measurement systems applied in the SPAWAR Program Directorates to determine what types of cost, scheduling and performance information they provide for the command. The components of the Program Directorates, the Program Manager Warfare, use a wide variety of locally designed computer programs and tracking systems to measure cost, scheduling and performance. This thesis forms a foundation for further analysis on cost and performance measurements in SPAWAR.

**DoD KEY TECHNOLOGY AREA:** Other (Performance Measurement, Cost Measurement)

**KEYWORDS:** Performance Measurement, Cost Measurement, Acquisition Program Measurement

### **VERIFICATION OF THE NEED FOR HOSPITAL CORPSMAN FOLLOW-ON/REFRESHER TRAINING**

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**Bernard J. Ulozas, Naval Training Warfare Center**

The Navy's Medical Department, in fulfilling its mission, requires an enormous amount of skilled manpower. Hospital Corpsmen account for a significant percentage of this population. Due to the variety of the needs of the Navy, Hospital Corpsmen are frequently assigned to jobs outside their respective skill areas, i.e., Security, Maintenance, and Administration. The resulting periods of nonutilization of corpsmen skills may lead to various levels of skill degradation. Upon reassignment to another operational unit or Medical Treatment Facility, retraining basic core competencies is necessary to re-establish and ensure a high degree of operational readiness. This study suggests the need to improve Hospital Corpsmen competency-based, follow-on training because of the perceptions of both corpsmen and supervisors that skill degradation does exist. Based on this analysis, this thesis concludes that command competency-based training, as practiced, does not work. Recommendations are submitted for improvement in areas of training, professional development, mentoring programs, and instructional technologies.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Leadership, Training, Recruitment, Skill Degradation

### **A BUSINESS PROCESS REDESIGN OF THE U. S. COAST GUARD PORT STATE CONTROL BOARDING PROCESS**

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**Master of Science in Information Technology Management-June 2000**

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**Mark E. Nissen, Department of Systems Management**

The United States Coast Guard Port State Control (PSC) is a port entry tracking process, which is currently performed primarily using paper and pencil. This thesis examines the feasibility and effectiveness of redesigning the PSC process in light of modern Business Process Redesign methodologies that incorporate contemporary information technology. The current process is modeled using the automated redesign tool, KOPeR, to identify pertinent redesign recommendations. A redesign of the process is completed using the recommendations provided by KOPeR and leveraging existing Coast Guard infrastructure and technology solutions. The effectiveness of the redesigned process is evaluated against the current process by using discrete event simulation models to compute the relative cycle times. Three different scenarios are run which show a potential annual reduction in manpower ranging from two to four person years. A Web-based prototype system, Re-engineered Port System (RePortS), is developed using basic tools such as Microsoft Access and Active Server Pages to demonstrate the feasibility of implementing the required functionality. The benefits of replacing the current manual system with a Web-based system are, reduced cycle time, increased accuracy and consistency in the process.

**DoD KEY TECHNOLOGY AREAS:** Computing and Software, Modeling and Simulation

**KEYWORDS:** Information Infrastructure, Business Process Re-Engineering, Simulation

### **INNOVATING THE STANDARD PROCUREMENT SYSTEM WITH INTELLIGENT AGENT TECHNOLOGIES**

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**Advisors: Mark E. Nissen, Department of Systems Management  
CDR David A. Smith, USN, Department of Systems Management**

This thesis analyzes the innovation of the Department of Defense (DoD) standard acquisition process with intelligent agent (IA) technologies. Information technology (IT) developments are enabling DoD to seek high levels of improvement in key processes, such as acquisition, because of constrained resources, high costs and long cycle times. One such process, DoD's paperless contracting initiative, is developed to increase efficiency through automation and standardization, using the Standard Procurement System (SPS). However, benefits to date from implementing SPS have been marginal, because it has been accomplished without first redesigning the existing inefficient process. This research builds upon prior work with procurement, process innovation and intelligent software agents. Following Davenport's process-innovation methodology, the Federal acquisition process (FAP) is compared with SPS functions to identify functions for possible IT innovation with IA. A four-step scheme for evaluating agent potential is developed and employed to assess the SPS-supported FAP, resulting in the identification of nine process steps offering high potential for IA automation. Two redesign prototypes are developed to incorporate these IA candidates. This work leads to a number of conclusions, recommendations and an agenda for further research that should be an interest to the acquisition manager as well as the information system designer.

**DoD KEY TECHNOLOGY AREA:** Other (Procurement)

**KEYWORDS:** Innovation, Standard Procurement System, Intelligent Agent Technologies

### **ENHANCED JOB PERFORMANCE: A NEW ROLE FOR MILITARY COMPENSATION**

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**B.S., Texas A&M University, 1990**

**M.S.B.A., Boston University, 1994**

**Master of Science in Management-June 2000**

**Advisors: David R. Henderson, Department of Systems Management  
Stephen M. Mehay, Department of Systems Management**

This study concentrates on aspects of military and civilian compensation that motivate employees and provide incentives upon which job performance and productivity may depend. The study achieves its end by applying successful attributes of civilian compensation to military remuneration systems. Its main purpose is to judge whether military pay is structured toward a modern view of performance-based compensation and whether it is comparable to civilian pay. At issue is a military pay system that is anchored to principles of institutionalism and paternalism. Instead of paying workers according to their respective contribution, the military continues to use a compensation system as old as the military itself. That is, it tailors compensation to a force of unskilled personnel serving as seaman and foot soldiers. In the twentieth century, as technological developments demand a skilled military force that calls for a greater percent of highly trained technicians, specialists, and craftsmen, focus upon compensation structures may prove critical. Hence, the need to assess military pay systems, which is the primary determinant of the price of military manpower, is all the more pressing.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, And Training

**KEYWORDS:** Compensation, Performance, Pay

### **COST AND BENEFIT ANALYSIS OF ALTERNATIVES TO THE NAVAL RESERVE OFFICER TRAINING CORPS FLIGHT PHYSICAL SCREENING PROCESS**

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**B.S., University of Minnesota, 1999**

**Master of Science in Management-September 2000**

**Advisors: William R. Gates, Department of Systems Management**

**Shu S. Liao, Department of Systems Management**

Questions have arisen concerning the efficiency of the Naval Reserve Officer Training Corps (NROTC) flight physical screening process. This study analyzed two alternative means to aeronautically assess these individuals: restructuring the pre-commissioning flight physical and opening the Aviation Certification Evaluation and Screening (ACES) program to all NROTC aviation candidates. A detailed description of the current NROTC aviation screening system, quantification and analysis of flight physical attrition rates, and recommendations for streamlining the overall process are also provided.

This thesis determined the optimal pre-commissioning flight physical site for every NROTC unit and used derived attrition information to estimate the cost of the current screening system, as well as the two selected alternatives. Further, all three screening options were compared against each other utilizing a cost-benefit analysis.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Naval Reserve Officer Training Corps (NROTC), Midshipmen, Officer Candidates, Naval Operational Medical Institute (NOMI), Flight School, Flight Physical, Screening, Attrition, Cost-Benefit Analysis

### **A CASE HISTORY OF THE UNITED STATES ARMY RAH-66 COMANCHE HELICOPTER**

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**Master of Science in Management-March 2000**

**Advisors: Keith F. Snider, Department of Systems Management**

**David F. Matthews, Department of Systems Management**

The RAH-66 Comanche Helicopter was initiated as the Light Helicopter Family (LHX) in 1982 when an Army Aviation Mission Area Analysis (AAMAA) identified the need for an armed reconnaissance aircraft. Eighteen years later, the program has yet to reach a Defense Acquisition Board Milestone II review.

This thesis described the history of the RAH-66 Comanche Helicopter acquisition program during these years. The research focused on the primary question of what significant events and issues have occurred over the course of the Comanche program that have allowed it to remain a viable program. The research draws several conclusions from the analysis of the Comanche's history. Mainly, despite the significant duration of the program, a valid need for an armed reconnaissance platform still exists. Secondly, the innovative program management of Comanche has maintained a positive reputation for the program. Finally, the loss of Comanche at this point in time would severely impact the defense helicopter industrial base.

**DoD KEY TECHNOLOGY AREAS:** Air Vehicles, Other (Acquisition, Program Management)

**KEYWORDS:** RAH-66 Comanche Helicopter, Light Helicopter Family (LHX), Acquisition, Program Management, Acquisition Strategy, U.S. Army Aviation, Defense Helicopter Industrial Base

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## THESIS ABSTRACTS

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### **THE IMPLEMENTATION OF ACTIVITY BASED COSTING AND MANAGEMENT AT THE NAVAL POSTGRADUATE SCHOOL: A TEACHING CASE STUDY**

**Bryan F. Gamble-Lieutenant Commander, United States Navy**

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**Master of Science in Management-June 2000**

**Advisors: Kenneth J. Euske, Department of Systems Management**

**Susan P. Hocevar, Department of Systems Management**

The Naval Postgraduate School (NPS) is an institution composed of a number of distinct groups. These include academic faculty, upper and mid-level civilian managers, civilian staff and military staff. These groups all work together within this organization that combines the traditional academic functions of a university and the bureaucratic administrative functions of a military command. This thesis focuses on the issues associated with the organization's attempt to implement a change in its long-standing financial management system. The data obtained during the research was used to develop a teaching case study that explores NPS' process of implementing Activity Based Costing and Management (ABCM). The case focuses on the ability and commitment to change. Specifically, the case and subsequent analysis can be used to illustrate an organization's desire to change and the likelihood of uncovering unanticipated problems during the process.

**DoD KEY TECHNOLOGY AREA:** Other (Organizational Change, Cost Management)

**KEYWORDS:** Organizational Change, Activity Based Costing and Management, ABC, ABM, ABCM

### **THE NAVAL ACADEMY-MARINE CORPS RELATIONSHIP: AN EXAMINATION OF THE MARINE CORPS' INFLUENCE ON THE ACADEMY AND THE ACADEMY'S PROFESSIONAL IMPACT ON THE MARINE OFFICER CORPS**

**Richard J. Gannon-Captain, United States Marine Corps**

**B.A., Cornell University, 1995**

**Master of Science in Leadership and Human Resource Development-June 2000**

**Advisors: Lee Edwards, Department of Systems Management**

**Keith F. Snider, Department of Systems Management**

This thesis examines and evaluates the historical and contemporary relationship of the Naval Academy and the Marine Corps. The study utilizes extensive historical, contemporary, quantitative, and qualitative analyses. The research is exploratory in nature and focused on the evolution of the present relationship, the perceived value of the relationship to the Marine Corps, the officer performance of academy graduates in the Marine Corps, and the scope of Marine Corps influence at the academy. Specifically, the study concentrates on identifying the contributions of the Naval Academy to the Marine officer corps and analyzing the effect of those contributions. The results of the study are the compilation of a historical account of the Marine Corps-Naval Academy relationship, an assessment of the tangible value of Naval Academy to the Marine officer corps, and the generation of an extensive exploratory body of research from which further studies can be initiated.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Naval Academy, Marine Corps, Officer Accessions, Officer Recruiting, Officer Candidate School, The Basic School, Pre-commissioning Training, Service Selection



**PARETO OPTIMUM IMPROVEMENT IN GOVERNMENT CONTRACTING**

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**Masters of Science in Management-December 1999**

**Advisors: David R. Henderson, Department of Systems Management**

**CDR Jeffrey R. Cuskey, USN, Department of Systems Management**

The Federal Government engages in regulatory efforts in its procurement activities for two reasons: to correct perceived market failure and to implement socio-economic policies. This research analyzes three major areas of Government acquisition for potential Pareto improvement: Small Business Programs, Cost Accounting Standards (CAS), and Certified Cost or Pricing Data. In cases where the Government seeks to implement socio-economic policy, as in the Small Business Programs, Pareto improvement cannot be achieved. However, in cases of market failure, Pareto improvement (making one party better off without making the other worse off) can be achieved. Pareto improvement can be realized by moving the CAS waiver authority to agency level, by eliminating specific CAS standards, and by increasing the CAS threshold to \$100 million. It can also be effected by implementing Price-Based Acquisition in specific contractual situations and by increasing the use of parametric cost estimating.

**DoD KEY TECHNOLOGY AREA:** Other (Acquisition and Contracting)

**KEYWORDS:** Pareto Improvement

**A CAPACITY AND COST ANALYSIS OF THE KOREAN FLAG SHIPPING PROGRAM**

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**Ira Lewis, Department of Systems Management**

South Korea's location forms the intersection of four world powers: Russia, China, Japan, and the United States. As such, the United States maintains political, economic, and military relations and agreements with the South Korean government for the national security of both nations. One such agreement is the Memorandum of Agreement (MOA), dated 25 March 1981, which established the Korean Flag Shipping (KFS) program. The KFS program (consisting of 59 ships) establishes the procedures and conditions upon which South Korean-flag vessels transfer operational control to Military Sealift Command (MSC) and carry United States military cargo in support of the South Korean defense. However, even with the addition of the 59 South Korean ships, MSC cannot meet the operational requirements for the Korean Peninsula Operation Plan. This thesis analyzes the KFS program in terms of ship capacities and South Korean cost considerations, and then recommends viable strategic sealift options that can enhance and/or supplement the KFS program.

**DoD KEY TECHNOLOGY AREA:** Other (Logistics, Transportation)

**KEYWORDS:** Strategic Sealift, Korean Flag Shipping (KFS) Program, Military Sealift Command (MSC), Maritime Policy, Logistics, Transportation

### **MINIMIZING TIME AWAITING TRAINING FOR GRADUATES OF THE BASIC SCHOOL**

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**Master of Science in Management-March 2000**

**Advisors: LCDR Douglas J. MacKinnon, USN, Department of Operations Research**

**Julie Filizetti, Department of Systems Management**

Graduates of The Basic School often spend longer than necessary waiting for their military occupational schools to start. Excessive waiting by graduates is the result of a scheduling conflict between Basic School graduation dates and the start dates of twenty one different schools. This classic scheduling problem results in less available manning for the operational forces. The goal of this thesis is to provide a desktop computer model, based on a linear program, that optimally distributes military occupational specialty quotas to all fiscal year Basic School companies and minimizes the time spent waiting by officers between graduation and the start of their occupational school; while also providing maximum equity of opportunity for all officers to seek any of the twenty one military occupational specialties. The Minimizing Time Awaiting Training model built in this thesis optimally allocates the annual quotas in an efficient and equitable manner using a Pentium II desktop computer in approximately ten seconds. Numerous model runs yielded a total time savings ranging from a high of forty-five work-years, to a low of twenty work-years.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Manpower, Linear Program, Military Occupational Specialties, Modeling, Time Awaiting Training

### **FACTORS THAT AFFECT SUCCESS IN IMPLEMENTING ACTIVITY BASED COST**

**MANAGEMENT IN A GOVERNMENT ORGANIZATION:**

**A COMPARATIVE CASE STUDY ANALYSIS**

**Scott W. Gray-Lieutenant, United States Navy**

**B.S., United States Naval Academy, 1994**

**Master of Science in Management-June 2000**

**Advisors: Kenneth J. Euske, Department of Systems Management**

**Susan P. Hocevar, Department of Systems Management**

In an era when the American public is focused on government financial accountability, leaders within the federal government are seeking ways to understand their costs. In December 1999, the Department of the Navy released its strategic plan to understand and manage the Total Ownership Costs of its assets and services. The plan gives local commanders the authority to choose which cost management tools to use, while strongly encouraging them to use Activity Based Cost Management (ABCM). To assist Navy commanders in their decisions, this research examines the factors affecting ABCM implementation in five divisions of one government bureau. The study categorizes the factors into behavioral, organizational, technical implementation, and work technology aids and hindrances. Relationships between a factor's presence in a division and its success in implementing ABCM indicate the factor's relevance. Technical implementation factors do not appear as relevant as factors related to behavior and work technology in driving ABCM implementations toward success or failure. However, among the factors identified, behavioral aids, such as an atmosphere of trust and cooperation; organizational aids, such as using ABCM as a tool to support innovation; and work technology aids, such as routine work processes, appear to drive ABCM toward success.

**DoD KEY TECHNOLOGY AREA:** Other (Cost Management)

**KEYWORDS:** Cost Management, Cost Measurement, Activity Based Cost Management, Implementation, Success Factors, ABCM, ABC, ABM

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## THESIS ABSTRACTS

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**THE ARMY OIL ANALYSIS PROGRAM (AOAP): COST BENEFIT ANALYSIS OF  
MAINTAINING THE PROGRAM FOR GROUND SYSTEMS  
AT FORT HOOD, TEXAS**

**Daniel J. Guilford-Major, United States Army  
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**Master of Science in Management-June 2000**

**Advisors: LTC Brad R. Naegle, USA, Department of Systems Management  
William R. Gates, Department of Systems Management**

The purpose of this thesis is to analyze the costs and benefits of maintaining the Army Oil Analysis Program (AOAP) at Fort Hood, Texas. Research will analyze the AOAP requirements, review both the current costs associated with executing the program and the potential or realized benefits gained from the program, and conduct a cost and benefit analysis of maintaining the program for ground systems at Fort Hood, Texas. This research will provide the information required to determine if the Army should maintain the AOAP at Fort Hood, Texas. It will also serve as a basis for either re-examining the program throughout the Army or for increasing investment by the Army into the program. This thesis concludes that the AOAP provides a net positive benefit to Fort Hood and the Army.

**DoD KEY TECHNOLOGY AREA:** Other (Spectrometric Analysis, Ferrographic Analysis)

**KEYWORDS:** Logistics Support

**ANALYSIS OF NAVAL FLIGHT OFFICER SELECTION, ASSIGNMENT, AND FLIGHT  
SCHOOL COMPLETION AMONG U.S. NAVAL ACADEMY GRADUATES**

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**B.A., University of North Carolina at Chapel Hill, 1990**

**Master of Science in Leadership and Human Resource Development-June 2000**

**Advisors: Gregory G. Hildebrandt, Department of Systems Management  
Walter E. Owen, Department of Systems Management**

There are three models analyzed in this study. The first two models attempt to determine whether academic rank, military rank, and major are predictive of Naval Flight Officer (NFO) service selection and NFO assignment. The goal of the third model, which predicts NFO completion, is to determine whether academic and military grades, major, personality, gender, and race predict completion of NFO flight training. Logistic regression is used to analyze the effect of the explanatory variables on the dependent variables.

The analysis shows that the first two models are not statistically significant predictors of NFO service selection and NFO service assignment. The NFO completion model displays the most interesting result of all three models. Military quality point rating is a highly significant predictor of completing NFO flight training. For midshipmen who select NFO as their first or second choice, the higher their military grades the more likely an Academy graduate will complete flight officer training. Further research is recommended to determine if military quality point rating is a significant predictor of completing one's initial training in other warfare communities.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Naval Academy, Naval Flight Officer, Flight School, NFO Flight Training, Midshipmen, Service Selection, Service Assignment

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## THESIS ABSTRACTS

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### **A FUNCTIONAL ANALYSIS OF CONSOLIDATING THE NAVY AND MARINE CORPS RECRUITING COMMANDS**

**Anne G. Hammond-Lieutenant Commander, United States Navy**  
**B.S., United States Naval Academy, 1986**  
**Master of Science in Management-June 2000**  
**Advisors: Lee Edwards, Department of Systems Management**  
**William R. Gates, Department of Systems Management**

In today's military, characterized by reduced budget authority and increasing worldwide commitments, synergy is required. Secretary of the Navy Danzig's plan for the future is to reduce costs and build a stronger and more effective Navy and Marine Corps team by increasing Navy/Marine Corps integration. The Navy and Marine Corps can no longer afford to maintain their insular and parochial attitudes and "go it alone." The resulting savings from more effectively and efficiently utilizing resources would help fund readiness and modernization objectives. This thesis proposes merging the Navy and Marine Corps Recruiting Commands to reduce redundancy, increase efficiency, and identify resource savings. As a result of data comparison, redundancies were identified in many of the special assistant and support areas, such as Public Affairs, Legal Affairs, Inspector General, Financial Management, Logistics, Manpower, Advertising/Marketing, and Information Systems. This "snapshot" of the structures, functions, and resources associated with the two existing commands can serve as a source of information for future studies.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Consolidation, Organization, Recruiting, Resource Savings

### **AN ANALYSIS OF THE FOREIGN MILITARY SALES OF THE M1 SERIES TANK**

**Robert J. Hannah-Major, United States Army**  
**B.S., United States Military Academy, 1988**  
**Master of Science in Management-June 2000**  
**Advisors: LTC Brad R. Naegle, USA, Department of Systems Management**  
**David V. Lamm, Department of Systems Management**

The purpose of this thesis is to identify and analyze the unique dynamics of the Abrams Main Battle Tank (MBT) Foreign Military Sales (FMS) program. The U.S. has sold the Abrams to Egypt, Saudi Arabia, and Kuwait in the 1990s. This thesis provides a detailed historical background of each program. Additionally, the numerous U.S. Government organizations that are involved in marketing and supporting the Abrams FMS program are described. Finally, marketing and contracting activities to support the Abrams FMS program are provided.

This research indicates that there are numerous items that are unique to the Abrams FMS program when compared to acquisitions for U.S. customers. Externally the FMS sales program is very competitive. Various political and economic situations have greatly impacted the program. Cultural and language barriers create other unique challenges in executing the program. Recommendations from this research are that all U.S. acquisition personnel should be trained on the unique aspects of the FMS business.

**DoD KEY TECHNOLOGY AREAS:** Conventional Weapons, Ground Vehicles

**KEYWORDS:** Foreign Military Sales, Abrams, Program Management, Case Study

### **THE RESIGNATION OF SECRETARY OF THE NAVY JAMES WEBB: A PERSPECTIVE FROM THE PRESENT**

**Bradly F. Hanner-Captain, United States Marine Corps  
B.S., United States Naval Academy, 1994**

**Master of Science in Leadership and Human Resource Development-March 2000**

**Advisor: Richard B. Doyle, Department of Systems Management**

**Second Reader: Stephen Wrage, United States Naval Academy**

This thesis explains the resignation of James Webb as Secretary of the Navy in February 1988. Multiple interviews conducted by the author and several others revealed the combination of politics and personal motivation behind his departure. In an era when defense expenditures were beginning to wane, Webb's insistence on maintaining the United States Navy's force structure in the face of Secretary of Defense Carlucci's unwillingness to do the same, led to his resignation. His opposition to the reduction-in-force structure was rooted in his fundamental belief that it was unwise for the United States, as a maritime nation, to undercut a service upon which it relied so heavily. Examination of Webb's professional life, with an emphasis on his numerous writings, conveyed his protracted association with, and critical thinking on, issues of military and national defense policy. Research into his professional development was central to the investigation. It established a consistency between his position on the Navy force structure issue and related topics about which he wrote and spoke concerning roles, missions, and composition of the American military.

**DoD KEY TECHNOLOGY AREA:** Other (Political - Military Leadership)

**KEYWORDS:** Force Structure, Secretary of the Navy, James H. Webb, Jr.

### **AN ACTIVITY-BASED COST ANALYSIS OF RECRUIT TRAINING OPERATIONS AT MARINE CORPS RECRUIT DEPOT, SAN DIEGO, CALIFORNIA**

**Jared J. Hansbrough-Captain, United States Marine Corps  
B.S., Virginia Tech, 1992**

**Master of Science in Management-June 2000**

**Advisors: Joseph G. San Miguel, Department of Systems Management**

**James M. Fremgen, Department of Systems Management**

Activity-based costing (ABC) has been embraced as the methodology which will be used to structure and organize cost management information for the Marine Corps. This methodology is applied to operations at the Marine Corps Recruit Depot, San Diego, California. Training operations have been examined for a three-year period from fiscal years 1997-1999. Cost analysis identifies total resource consumption of \$230 million annually, depot level activities, and the services and products provided by the depot. Detailed information is provided for determining the cost to train a Marine, which is \$13,300. Capacity analysis discusses the output of training operations under four capacity frameworks, theoretical, practical, normal, and annual budgeted capacity. Analysis of minimum resource usage examines process scheduling and the quantity of training companies needed. The core competencies of the depot are discussed and value chain analysis is used to map the depot activities into the Porter value chain model. Final recommendations offer improvements to existing ABC models and opportunities for operational cost savings.

**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training, Other (Activity-Based Costing)

**KEYWORDS:** Activity-Based Costing, Recruit Training, Capacity Analysis, Core Competencies, Value Chain

**MALAYSIAN ECONOMIC CRISIS: CAUSES, EFFECTS, RECOVERY ACTIONS,  
AND LESSONS LEARNED**

**Amir Hashim-Lieutenant Colonel, Royal Malaysian Air Force  
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**Master of Science in International Resource Planning and Management-June 2000**

**Advisors: Robert E. Looney, Department of National Security Affairs  
Roger D. Evered, Department of System Management**

Malaysia and several East Asian economies have been caught in the grip of the currency crisis that started in July 1997. At the start of the crisis, Malaysia adopted a tight fiscal and monetary policy in response of the economic environment prevailing at that time. It was obvious that the initial policy package resulted in severe economic contraction and deterioration in the health of the financial system. In response, the Government unveiled the National Economic Recovery Plan (NERP) which recommended a complete reversal of key policies. The NERP called for an easing of fiscal and monetary policy, an increase in government spending, corporate debt restructuring, and establishment of special vehicles to purchase and recapitalize non-performing loans from banking institutions. On September 1, 1998 the Government introduced capital controls and pegged the exchange rate to the U.S. dollar, in order to insulate the domestic interest rate from continuing pressure and volatility in the foreign exchange market. This thesis explores the measures taken by the Malaysian Government to cope with the recent economic crisis and describes the effects and lessons learned. The proper implementation of the selective capital control has given Malaysia a breathing space to pursue its on-going economic related programs.

**DoD KEY TECHNOLOGY AREA:** Other (Economics)

**KEYWORDS:** Malaysian Economic Crisis

**PROCESS MAPPING AND RE-ENGINEERING FOR IMPROVED RECEIVING AT A  
DEFENSE DISTRIBUTION DEPOT**

**Charles K. Head-Lieutenant Commander, United States Navy  
B.S., United States Naval Academy, 1988  
Master of Science in Management-December 1999**

**and**

**Vaughn L. Stocker-Lieutenant Commander, United States Navy  
B.S., Kearney State College, 1988  
Master of Science in Management-December 1999**

**Advisors: Kevin R. Gue, Department of Systems Management  
Ira Lewis, Department of Systems Management**

The Defense Distribution Depot San Diego (DDDC) is the primary department of defense (DoD) physical distribution agency in southern California. DDDC management is striving to improve DDDC's competitive posture by identifying and eliminating inefficient practices in receiving, order picking, and shipping. Receiving processes are investigated by constructing a detailed process map that shows how material and information move through the depot. The map is used to identify redundant material handling practices and to suggest ways to reduce material receipt-to-stow times. Results suggest that Dddc can improve receipt processing times and reduce labor costs.

**DoD KEY TECHNOLOGY AREA:** Other (Logistics)

**KEYWORDS:** Re-Engineering, Process Mapping, Defense Distribution Depot, Defense Logistics Agency

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## THESIS ABSTRACTS

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### **A COMPREHENSIVE ANALYSIS OF THE ENVIRONMENTAL REMEDIATION INDUSTRY**

**Ronald E. Hill-Major, United States Army**

**B.A., Northwestern State University, 1987**

**Master of Science in Management-June 2000**

**Advisors: David V. Lamm, Department of Systems Management**

**CDR David A. Smith, USN, Department of Systems Management**

As a result of the legislation enacted over the past 20 years, American Government and industry are currently spending about \$115 billion a year to meet environmental goals. This amount is expected to increase to \$160 billion a year by the end of the year 2000. State and local governments, which will have to bear a particularly large share of this increase, face over \$80 billion in investment costs for wastewater alone, and the federal government will have to spend about \$200 billion simply to clean up contaminated Department of Defense and Department of Energy installations. Altogether, the nation has invested about \$1 trillion in environmental protection over the past 20 years. This analysis was designed to find out whom the DoD does business with in the environmental remediation industry. Key findings of this study are (1) Environmental Remediation companies are not dependent on the DoD business for survival, (2) Small businesses dominate the environmental remediation industry, (3) A majority of the environmental remediation companies provide services versus goods, (4) Environmental remediation companies are located in states with strict environmental laws.

**DoD KEY TECHNOLOGY AREA:** Other (Environment, Contracting, Acquisition, Logistics)

**KEYWORDS:** Environmental Remediation Industry, Contracting, Environmental, Industry

### **REDUX AND READINESS: CONGRESS, THE DEFENSE BUDGET, AND MILITARY RETIREMENT IN 1999**

**Michael W. Howell-Lieutenant, United States Navy**

**B.A., North Carolina State University, 1992**

**Master of Science in Management-December 1999**

**Advisors: Richard B. Doyle, Department of Systems Management**

**John E. Mutty, Department of Systems Management**

In 1999, the 106<sup>th</sup> Congress enacted military retirement reform for personnel entering the military after 31 July 1986. This thesis examines the process by which this reform was enacted and its impact on defense spending. To conduct the analysis, a review of articles, journals, government reports, and legislation related to retirement reform was completed. The estimated cost of reform was \$796 million for FY 2000 and totaled nearly \$6 billion by FY 2004. Congress modified military retirement by offering members the choice of remaining under Redux and receiving a \$30,000 bonus or retiring under the High Three Plan. The 1999 Emergency Supplemental appropriated \$10.9 billion dollars to improve military readiness, including funds for retirement reform assuming that it would improve retention and readiness. Congress approved the changes in the 2000 Authorization Act. Reform was facilitated by the designation of the funds as an emergent requirement to improve readiness and the emergence of an on-budget surplus of \$14 billion for FY 2000.

**DoD KEY TECHNOLOGY AREA:** Other (Military Retirement)

**KEYWORDS:** Military Retirement, Military Retirement Benefits, Military Retirement Reform, Redux, Emergency Supplemental Spending, Budget Enforcement Act of 1990, Readiness

### **DEVELOPING A CORE COMPETENCY MODEL FOR INFORMATION SYSTEMS MANAGEMENT OFFICERS IN THE UNITED STATES ARMY**

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**B.S., United States Military Academy, 1991**

**Master of Science in Management-June 2000**

**and**

**Stephen T. Willhelm-Major, United States Army**

**B.B.A., Stephen F. Austin State, 1988**

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**Advisors: William J. Haga, Department of Systems Management**

**Frank J. Barrett, Department of Systems Management**

As DoD and the Army move into the 21<sup>st</sup> Century, the technologies that abound are increasing not only volume but also in complexity. In order to manage and leverage these technologies, a clear vision needs to be articulated starting at the very top of DoD. With this vision, it will then become the responsibility of the Army's System Automation Officers (FA 53) to implement that vision. The challenge then becomes, what exactly are the core competencies, or more plainly put, what knowledge, skills and attributes must these officers possess, in order to be successful in carrying out the Army's overarching plans. Once these competencies are identified, how do we ensure our officers' success by training them in these competencies in Army and civilian institutions? This thesis examines these questions and, through use of core competency modeling (specifically, the Customized Generic Model Method), will identify the core competencies of a systems automation officer and explore avenues to improve the efficiency of the FA 53 education.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Army Officers, Information Technology, Core Competencies, and Training

### **WARRANTY/CANNIBALIZATION ISSUES, DISRUPTIVE FORCES IN THE PRODUCTION AND MAINTAINABILITY OF THE E-2C AIRCRAFT**

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**Advisors: Michael W. Boudreau, Department of System Management**

**William R. Gates, Department of System Management**

This thesis analyzes manufactures' warranties and cannibalization issues as they affect the maintainability on the E-2C aircraft. The analysis includes cannibalization structures, reasons why squadrons cannibalize, alternatives to cannibalization, cannibalization issues that affect maintenance personnel morale, and the disruptive effects of manufacturers' warranties to the fleet.

The research identified that introducing production aircraft to the fleet without proper logistical support increases aircraft cannibalization and decreases maintainability. Cannibalization should not be used to increase aircraft readiness, since it doubles maintenance man-hours and depletes resources. Inconsistent Aviation Maintenance and Material Management (AV-3M) data contributes to aircraft cannibalization. An acquisition strategy that identifies logistics problems early will give the logistician an opportunity to decrease cannibalization.

**DoD KEY TECHNOLOGY AREA:** Materials, Processes, and Structures

**KEYWORDS:** Manufacturer Warranties, Cannibalization, Maintenance



**ARE COMMERCIAL PORTS IN THE CONTINENTAL U.S. CAPABLE OF SUPPORTING  
MILITARY SEALIFT REQUIREMENTS IN EVENT OF A MAJOR THEATER WAR OR  
OTHER MAJOR CONTINGENCY?**

**Thomas C. Kait, Jr.-Lieutenant, United States Navy  
B.S., United States Naval Academy, 1993**

**Master of Science in Management-March 2000**

**Advisors: Ira A. Lewis, Department of Systems Management  
William R. Gates, Department of Systems Management**

This thesis examines the potential impact of military deployment operations in a commercial port. With the closures of the Military Ocean Terminals in Oakland, California and Bayonne, New Jersey, the military must rely, almost entirely, on utilizing commercial ports to support all deployments. These deployments, from supporting routine exercises to major theater wars, will sometimes conflict with the routine operations of the commercial customers in the port.

This thesis discusses the roles of the organizations involved in supporting military deployments from commercial ports and the federal laws in place to ensure there are commercial facilities available to support deployments when required.

This study concludes by identifying areas of concern and making recommendations related to improving military deployments through commercial ports.

**DoD KEY TECHNOLOGY AREA:** Other (Strategic Sealift)

**KEYWORDS:** Commercial Strategic Port, Commercial Port Authorities, National Port Readiness Network, Sealift

**A COMPARISON OF U.S. NAVY SEA AIR LAND (SEAL) TEAMS AND U.S. ARMY  
SPECIAL FORCES**

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B.S., United States Naval Academy, 1992**

**Master of Science in Leadership and Human Resource Development-June 2000**

**Advisors: Gregory G. Hildebrandt, Department of Systems Management  
Lee Edwards, Department of Systems Management**

Navy Sea Air Land (SEAL) Teams and Army Special Forces (SF) are distinct organizations that often compete for the same missions, and this thesis provides a comparison of the two organizations. Others have provided detailed accounts of both the operational and political backgrounds that resulted in SEALs and SF being placed under the United States Special Operations Command (USSOCOM).

This thesis provides a narrative of the relevant operational and political events that influenced the present organizational cultures of the SF and SEALs. Most notably, both units had their origins in World War II. SF were most heavily influenced by the unconventional warfare (UW) experiences in Europe, and the SEALs were most heavily influenced by the experiences of "frogmen" who prepared beaches for opposed amphibious landings. Both SF and SEALs faced an uncertain existence until the creation of SOCOM, and they willingly branched into additional mission areas.

The material presented can be used as a framework to understand the friction that is sometimes present between conventional and special operations units. It can also be employed as a template for assessing how future actions will fit within the SF and SEAL organizational cultures.

**DoD KEY TECHNOLOGY AREA:** Human Systems Interface

**KEYWORDS:** Special Operations, SEAL, SOCOM, United States Special Operations Command, Special Warfare, Department of Defense

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## THESIS ABSTRACTS

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### **AN ANALYSIS OF OPERATIONAL AVAILABILITY OF BRAZILIAN NAVY AND ARGENTINE AIR FORCE A-4 FLEETS USING SIMULATION MODELING**

**Mario Karpowicz-Major, Argentine Air Force  
B.S., Escuela de Ingeniería Aeronáutica, 1982  
Master of Science in Management-March 2000**

**and**

**Marcelo B. Rodrigues-Lieutenant Commander, Brazilian Navy  
B.S., Brazilian Naval Academy, 1983  
Master of Science in Management-December 1999**

**Advisors: Keebom Kang, Department of Systems Management  
Donald R. Eaton, Department of Systems Management**

This thesis analyzes the impact of reducing transportation cycle time and consolidating aviation electronic component inventory management on the operational availability of the Brazilian Navy and Argentine Air Force A-4 fleets. The research is based on a scenario where the Brazilian Navy operates twenty A-4 aircraft, while the Argentine Air Force operates thirty A-4s, and both countries rely on manufacturers in the United States for depot-level maintenance. The transportation turn-around-time is extremely long and the cost of some inventory items is very high. A simulation model was developed representing the repair process of a selected group of A-4 critical electronic components. This particular model provides an effective managerial resource for long-term decision making to improve the readiness of aircraft fleet for both countries. We also developed a multiple regression analysis model (metamodel) to find the relationship between spare inventory levels and the operational availability. These results were applied to a linear programming model to find optimal spare levels for these critical components by minimizing the total cost while maintaining the desirable military readiness. Through a cost-effectiveness analysis, we compared the two situations, optimal spare levels with reduced transportation time and actual spare level with current transportation time. Our research concludes that both Armed Forces will improve readiness, while achieving significant savings, if they reduce the transportation time for the aviation electronic components sent to the United States for depot-level maintenance, and collaborate on the inventory management of their A-4 fleets.

**DoD KEY TECHNOLOGY AREA:** Other (Logistics)

**KEYWORDS:** Inventory Management, Operational Availability, Simulation Modeling, Transportation Costs, Aviation Depot-Level Maintenance

### **THE DELAYED ENTRY PROGRAM AND GENERATION Y**

**Mery-Angela S. Katson-Lieutenant, United States Navy  
B.A., University of San Diego, 1991  
Master of Science in Management-June 2000**

**and**

**Mary Blankenship-Lieutenant, United States Navy  
B.S., Saint Joseph's University, 1990  
Master of Science in Management-March 2000**

**Advisors: Alice M. Crawford, Department of Systems Management  
William J. Haga, Department of Systems Management**

This thesis studied why recruits leave the Navy Delayed Entry Program (DEP). It employs a two-pronged methodology through analysis of both secondary data and primary data. The secondary data analyzed consist of the Youth Attitude Tracking Study (YATS) and the New Recruit Survey (NRS). The primary data analyzed consisted of a focus group with DEP personnel and a telephone survey of DEP dropouts. Emphasis is placed on the attitudinal characteristics of Generation Y in relation to Navy recruits. Recommendations are offered for the Navy DEP program.

**DoD KEY TECHNOLOGY AREA:** Other (Navy Recruiting)

**KEYWORDS:** Delayed Entry Program (DEP), Generation Y, Attrition, Navy Recruiting, Youth Attitude Tracking Study (YATS), New Recruit Survey (NRS)

**ANALYSIS OF FUEL TANKER VESSELS AVAILABLE IN A DUAL MULTI-THEATER  
WAR (MTW)**

**Thomas J. Keane-Lieutenant Commander, United States Navy  
B.S., California State Polytechnic University Pomona, 1987  
Master of Science in Management-March 2000**

**Advisors: Rodney E. Tudor, Department of Systems Management  
Lee Edwards, Department of Systems Management**

This thesis develops a database and makes projections of fuel tanker vessels available between now and 2010 that can support U.S. forces in wartime. The United States Transportation Command and Military Sealift Command must ensure there are sufficient fuel tanker vessels to transport fuel to the forces in a dual multi-theater war (MTW). Once the available assets are known, then DOD can determine the adequacy of the number of vessels based on the fuel requirements. These vessels are of two categories: DOD organic assets and commercial fuel tanker assets.

What this thesis shows is that DOD assets will remain virtually the same for the next ten years but the number of U.S.-flag tanker vessels will decline dramatically. In a dual MTW scenario there will not be enough DOD or U.S. flag tanker vessels available to meet demand. DOD must consider an alternative policy of outsourcing to foreign flag vessels for the delivery of fuel products to U.S. Armed Forces during war.

**DoD KEY TECHNOLOGY AREA:** Other (Petroleum, Fuel Tanker)

**KEYWORDS:** Logistics, Fuel

**FRAME RATE EFFECTS ON HUMAN SPATIAL PERCEPTION IN VIDEO INTELLIGENCE**

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**Master of Science in Information Technology Management-September 2000**

**Advisors: Rudolph P. Darken, Modeling, Virtual Environments, and Simulation Academic Group  
LtCol Terrance C. Brady, USMC, Department of Systems Management**

This thesis examines the effect that the frame rate of a streaming video feed has on one's ability to maintain spatial perception. It defines the current technologies available to capture and encode digital video. It describes the current and near future wireless information systems that could be utilized to support streaming video.

This thesis investigates through experimental trials of subjects viewing video streams at different frame rates, the effect those frame rates have on the subject's spatial perception. This thesis analyzes and summarizes the data collected from this experiment and provides recommendations. It is determined that the inherent chaotic nature of tactical movement and the method used to encode digital video are not compatible for video streams with high motion in the three dimensional planes. Results of this analysis suggest that a large amount of bandwidth would be consumed to provide the minimum quality of service indicated by the data and suggests that video to the commanders at the frontline is not a useful allocation of bandwidth.

**DoD KEY TECHNOLOGY AREAS:** Command, Control, and Communications, Computing and Software, Human Systems Interface, Modeling and Simulation

**KEYWORDS:** Reconnaissance, Digital Video Imagery, Real-time Video, Wireless Communications, Bandwidth, Spatial Perception

### **FINANCIAL RATIO ANALYSIS OF AUDITED FEDERAL FINANCIAL STATEMENTS**

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**B.S., United States Naval Academy, 1999**

**Master of Science in Management-June 2000**

**Advisors: O. Douglas Moses, Department of Systems Management**

**Shu S. Liao, Department of Systems Management**

In recent years, the U.S. Congress has called upon federal government agencies to produce auditable financial statements which adhere to many of the same accounting standards as private businesses. The purpose of these statements is to fully reveal federal entities' financial position, in the hope of enabling a better understanding of these federal entities, and to assist in resource management. The information contained in these federal financial statements permit the calculation of numerous financial ratios. The objective of this thesis was to examine the ability of a set of federal financial ratios to measure aspects of the financial condition of government agencies. To accomplish this, the thesis relied upon a previously developed financial ratio framework. Financial ratios proposed in the framework were calculated for major government agencies. Statistical tests were used to describe the distribution of each ratio and the relationship between the ratios. Broad conclusions are that numerous financial ratios exist, which do have the ability to distinguish differing aspects of the financial condition of government agencies, but that the conceptual meaning of some proposed federal financial ratios is not yet well understood.

**DoD KEY TECHNOLOGY AREA:** Other (Financial Management)

**KEYWORDS:** Ratios, Ratio Analysis, Financial Ratio Analysis, Financial Statements, Financial Statement Analysis, Federal Financial Reports, Accountability Reports, Chief Financial Officers Act

### **OUTSOURCING THE HELICOPTER COMBAT SUPPORT MISSION ABOARD MILITARY SEALIFT COMMAND SHIPS: A COST COMPARISON STUDY**

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**B.S., University of Mississippi, 1991**

**Master of Science in Management-June 2000**

**Advisors: William R. Gates, Department of Systems Management**

**John E. Mutty, Department of Systems Management**

Recently the Department of Defense and the Navy have sought new avenues for achieving the national security of the United States within the scope of available resources. In an attempt to meet savings objectives, the Navy has looked toward outsourcing the Helicopter Combat Support (HC) mission aboard Military Sealift Command (MSC) ships. After several evaluations with civilian helicopter companies, the Navy awarded Geo-Seis Helicopters, Inc. a three-year contract for ship-to-ship and ship-to-shore logistics services.

This thesis evaluates the current outsource contract and compares costs of the contract to those of the HC community. The purpose was to determine the level of savings and the differences in services provided. Within the course of this study, the total in-house cost was established for the HC squadrons flying the H-46 aircraft. This cost was then fractured down to equal the services provided by the contractor to determine the most efficient organization.

This thesis ascertained that the current outsource contract does provide a small savings but at the costs of increased risk in not meeting surge requirements for unplanned contingencies. Furthermore, inherent risks are associated with the inability to fill personnel billets within other areas of the Navy through reduced manning levels due to outsourcing.

**DoD KEY TECHNOLOGY AREA:** Other (Cost Management)

**KEYWORDS:** Outsourcing Helicopter Combat Support Mission, Military Sealift Command, Comparative Analysis

### **A COST ANALYSIS OF THE DECISION TO CANNIBALIZE MAJOR COMPONENTS OF THE NAVY'S H-60 HELICOPTERS AT THE OPERATIONAL LEVEL**

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**M.B.A., University of Phoenix, 1996**

**B.S., United States Naval Academy, 1982**

**Master of Science in Management-June 2000**

**Advisors: Donald R. Eaton, Department of Systems Management**

**Shu S. Liao, Department of Systems Management**

Cannibalization is a technique, sanctioned by the Navy, for maintenance managers to optimize aircraft availability by circumventing a slow or inadequate logistics support system. Maintenance managers often make a decision to cannibalize without considering the total cost of their decision. This thesis examines the costs incurred by an operational H-60 helicopter squadron to cannibalize major components and addresses the impact of cannibalization on the mean time between failure for the cannibalized components. The costs to cannibalize a T700-GE-401C engine, a tail rotor blade and an auxiliary power electronic control unit were calculated by assigning a dollar value to the increased manpower, consumables and flight time that could have been avoided if cannibalization were not used. The units cannibalized in 1996 were tracked by serial number through 1999 to compare their mean time between failure to similar non-cannibalized units tracked for the same period. The findings were that cannibalization considerably decreases the time between failure for cannibalized components which can have far-reaching effects on the size and costs of the Navy's inventory of spare parts. The increased manpower, consumables and flight time required has a significant impact on an operational squadron's workforce and budget.

**DoD KEY TECHNOLOGY AREA:** Air Vehicles

**KEYWORDS:** Cannibalization, Aircraft Maintenance, Cost Analysis

### **LEADERSHIP TRAITS AND CHARACTERISTICS OF EFFECTIVE COMPANY OFFICERS AT THE UNITED STATES NAVAL ACADEMY: THE MIDSHIPMEN PERSPECTIVE**

**Eric R. Kyle-Lieutenant Commander, United States Navy**

**B.S., United States Naval Academy, 1986**

**Master of Science in Leadership and Human Resource Development-June 2000**

**Advisors: Alice M. Crawford, Department of Systems Management**

**Gail F. Thomas, Department of Systems Management**

This thesis provides the reader with insight into what leadership traits and characteristics Midshipmen at the United States Naval Academy desire in an effective Company Officer. The author interviewed 40 Midshipmen in eight separate focus group sessions comprised of five Midshipmen in each group. The data from the focus group sessions were analyzed to produce a list of desired leadership traits and characteristics. This list was presented back to 1,392 Midshipmen in survey format. The top seven traits and characteristics Midshipmen admire most in effective Company Officers are: (1) Approachable, (2) Trusting, (3) Not a Form-2 Leader, (4) Fair, (5) Understanding, (6) Respected, and (7) Knowledgeable about his/her people. Each of the top seven traits is discussed in detail, and quotes from the focus group interviews are provided to give the reader deeper insight. The results of the USNA study are different than those found in other studies on leadership. The author discusses these differences. The author's conclusion is that leading Midshipmen is different than leading in both military and non-military environments. Small changes in leadership style will make a Company Officer more effective in the eyes of Midshipmen.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Leadership, Leadership Development, Leadership Style

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## THESIS ABSTRACTS

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### **ANALYSIS OF THE COMPANY OFFICER MANAGEMENT INFORMATION SYSTEM (COMIS) PERFORMANCE MEASUREMENT SOFTWARE AT THE UNITED STATES NAVAL ACADEMY**

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B.S., United States Naval Academy, 1993**

**Master of Science in Leadership and Human Resource Development-June 2000**

**Advisors: Walter E. Owen, Department of Systems Management**

**Keith F. Snider, Department of Systems Management**

The United States Naval Academy is a federal organization charged with developing Midshipmen morally, mentally, and physically, so that they may become future officers in the Navy and Marine Corps. In order to better monitor the development of Midshipmen, the Academy requires some form of a performance measurement tool. Recently, the Midshipman Information Database System (MIDS) was created to store information about each Midshipman. In 1999, the Company Officer Management Information System (COMIS) prototype was created to work in conjunction with MIDS to enhance a Company Officer's ability to develop Midshipmen and measure their performance.

This research involves presenting the COMIS prototype to a sample of Company Officers, and gathering their opinions through a survey. The results of the survey are compiled to determine how well COMIS is received by Company Officers and what improvements to COMIS should be made in the future.

The results of this research show that Company Officers feel COMIS is a useful performance measurement tool, and that its development should continue. The best avenue of COMIS development is to incorporate it into a module of MIDS. Combining these two computer programs into one will significantly enhance the development of Midshipmen well into the 21<sup>st</sup> century.

**DoD KEY TECHNOLOGY AREAS:** Computing and Software, Human Systems Interface, Other (Information Technology, Performance Measurement)

**KEYWORDS:** COMIS, Database, Management Information System, Performance Measurement, Prototype, Survey

### **EVALUATING POLICY ALTERNATIVES FOR THE RE-ENGINEERING OF THE DEPARTMENT OF DEFENSE PERSONAL PROPERTY SHIPMENT AND STORAGE PROGRAM - A STAKEHOLDER APPROACH**

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B.A., The American University, 1988**

**Master of Science in Management-December 1999**

**Advisors: Nancy C. Roberts, Department of Systems Management**

**Cary A. Simon, Department of Systems Management**

The Military Traffic Management Command (MTMC) is currently re-engineering the DOD Personal Property Shipment and Storage Program. DOD is conducting three pilot projects in support of this effort. Each pilot project represents a policy alternative for improving moving services for military families. The Deputy Under Secretary of Defense (Logistics) tasked United States Transportation Command (USTRANSCOM) to evaluate the personal property pilot programs as part of Management Reform Memorandum # 6. This thesis evaluates the policy alternatives for reengineering the DOD personal property program using a stakeholder approach.

The study develops a model and establishes criteria for evaluating the three policy alternatives. Values are determined for the criteria by interviewing a sample of stakeholders from business, government, and customers. Policy alternatives are then analyzed from each stakeholder perspective. Finally, a policy alternative is identified that best satisfies the criteria for each stakeholder as well as the aggregate of stakeholders.

**DoD KEY TECHNOLOGY AREA:** Other (Policy Analysis, Transportation)

**KEYWORDS:** Transportation, Personal Property, Policy Analysis, Stakeholder Approach

**THE IMPACT OF ATHLETIC ACHIEVEMENT AT THE UNITED STATES NAVAL ACADEMY  
ON FLEET PERFORMANCE**

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B.S., United States Naval Academy, 1993**

**Master of Science in Leadership and Human Resource Development-June 2000**

**Advisors: Stephen L. Mehay, Department of Systems Management  
William Bowman, United States Naval Academy**

The mission of the United States Naval Academy speaks clearly of three pillars of Midshipman development: moral, mental, and physical. Each is equally important; however, the mission of the Naval Academy to develop Midshipmen physically is often overlooked. This thesis investigates the advantages and disadvantages of the varsity sports programs of the Naval Academy to provide more accurate and detailed information to policy makers regarding the importance of athletics.

Specifically, this study analyzes the role of achievement in varsity athletics on fleet performance. Using data on the Naval Academy classes of 1981-1985, six multivariate models are specified. The first analyzes variables identified in previous studies as being significant in explaining performance or promotion, and is used as a baseline for the remaining models. The second model analyzes the overall effect of athletic achievement on promotion. The next model analyzes the differential effects of achievement in a team sport versus an individual sport versus no sport at all. The effects of being a female athlete and minority athlete are then identified, followed by an analysis of blue-chip athletes. The results find that four of the variables indicating athletic achievement have positive and significant effects on promotion to Lieutenant Commander. Being a Blue-chip team athlete increased the probability of promotion 18.9 percent, being a Team athlete increased the probability of promotion 11.4 percent, being a Varsity athlete increased the probability of promotion 7.7 percent, and being a Blue-chip non-athlete increased the probability of promotion 6.4 percent.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Military Officers, U.S. Naval Academy, Performance, Retention, Sports, Athletes

**DESIGN AND COST-BENEFIT ANALYSIS OF A MINI THERMO-ACOUSTIC  
REFRIGERATOR DRIVER**

**Omer Livvarcin-Lieutenant Junior Grade, Turkish Navy  
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**Master of Science in Engineering Acoustics-September 2000**

**Master of Science in Management-September 2000**

**Advisors: Thomas J. Hofler, Department of Physics  
Roger D. Evered, Department of Systems Management**

A miniature thermoacoustic refrigerator is being developed for the purpose of cooling integrated circuits below their failure temperature when used in hot environments. This thesis describes the development of an electrically powered acoustic driver that powers the thermoacoustic refrigerator. The driver utilizes a flexural tri-laminar piezoelectric disk to generate one to two Watts of acoustic power at 4 kHz in 15 bar of He-Kr gas mixture.

This thesis also provides a cost analysis of the Mini TAR and a comparison with other cooling methods in terms of cost and benefits. It estimates the unit cost of a Mini TAR and compares it with other existing microchip coolers in terms of cost and benefits.

**DoD KEY TECHNOLOGY AREAS:** Air Vehicles, Electronics

**KEYWORDS:** Thermoacoustics, Refrigeration, Acoustic Driver, Piezoelectric Driver, Cost and Benefit Analysis

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## THESIS ABSTRACTS

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### **ANALYSIS OF CONTRACT DISPUTES RESOLVED BY THE ARMED SERVICES BOARD OF CONTRACT APPEALS (ASBCA) BETWEEN JANUARY 1998 AND JUNE 1999**

**Roger D. Lord-Lieutenant Commander, United States Navy**

**B.S., Southern Illinois University, 1987**

**A.S., Mohegan Community College, 1986**

**Master of Science in Management-December 1999**

**Advisor: CDR David A. Smith, USN, Department of Systems Management**

**Second Reader: William R. Gates, Department of Systems Management**

The primary purpose of this thesis is to analyze recent Armed Services Board of Contract Appeals (ASBCA) decisions relating to disputes in United States Government supply, services, and construction contracts in order to identify potential weaknesses in both Government and contractor organizations. In particular, the researcher is interested in Department of Defense (DoD) contracting norms and execution practices. This thesis identifies categories of contract disputes, as well as patterns of contract administration weaknesses, of both the Government and the contractor. The aim is to bring these dispute categories and contracting weaknesses to the attention of the acquisition professional in order to promote better administration of contracts in the future, with the potential effect of reducing the number of litigated contract disputes between the Government and commercial supply, services, and construction providers. Finally, this research effort offers recommendations to Contracting Officers and contracting activities to help provide for more effective and efficient contract execution and administration within the Government and, in particular, the Department of Defense.

**DoD KEY TECHNOLOGY AREA:** Other (Contract Disputes)

**KEYWORDS:** Contract Disputes, Supply, Service, Construction Contracts

### **EVALUATING NAVAL AIR WARFARE CENTER AIRCRAFT DIVISION (NAWCAD) FINANCIAL MANAGEMENT PRACTICES IN PREPARATION FOR IMPLEMENTING ERP**

**Robert E. Louzek-Commander, United States Navy Reserve**

**B.A., Syracuse University, 1976**

**Master of Science in Management-June 2000**

**Advisors: Kenneth J. Euske, Department of Systems Management**

**William J. Haga, Department of Systems Management**

This thesis examines the current financial management processes in place at Naval Air Warfare Center Aircraft Division (NAWCAD) and the impact an implementation of an Enterprise Resource Planning (ERP) system would have on these processes. The Department of the Navy is committed to bringing current best business practices within its organizational structure in order to meet reduced budget guidelines. NAWCAD has embraced the best practices principle by changing their structure to a Competency Alignment Organization (CAO). Currently, an ERP implementation is under consideration as another means to applying a current business practice that will make NAWCAD a more efficient and effective organization. The objective of this thesis was to evaluate the financial management processes and how ERP would affect them. Research on ERP definition and implementation in the private and public sector was conducted. Interviews with NAWCAD financial management managers and analysts were used to compare and contrast the current processes in place with those processes that would be developed as the result of implementing ERP. This thesis is part one of a two-part study. Part one provides the necessary background for a follow-up study that will examine the financial management system used by NAWCAD after ERP is implemented.

**DoD KEY TECHNOLOGY AREA:** Manufacturing Science and Technology (MS&T)

**KEYWORDS:** Financial Management, Enterprise Resource Planning, Competency Aligned Organization



### **CLOSING THE GAP BETWEEN BUDGET FORMULATION AND EXECUTION**

**Erainust Lowery-DoD Civilian**

**B.S., Regents College, 1995**

**Master of Science in Management-June 2000**

**Advisors: John E. Mutty, Department of Systems Management**

**Lawrence R. Jones, Department of Systems Management**

This thesis is a case study analysis of the Resource Management Office of the Bureau of Naval Personnel (PERS-02). Specifically, an analysis of projected versus actual budget figures was conducted. The purpose of the research was to explain anomalies in the budget formulation figures as compared to actual budget execution figures and define ways to improve the protocol between budget activities. Based on model comparisons, document reviews, and semi-structured interviews of PERS-02 leaders and managers, there were indications that PERS-02 had been severely stressed due to personnel reductions, a partial relocation to Millington, TN, and less than anticipated time savings from information technology management changes. Recommendations are offered to assist leaders and managers in making systematic changes to improve the efficiency and effectiveness of PERS-02 with the goal of increasing accuracy during budget formulation. Specific recommendations include: creation of realistic training programs tailored to enhance individual knowledge and skill sets, increased use of automated data systems geared to budget formulation and execution such as Budget Builder and FASTDATA, and work schedule changes using shifts for both days and evenings.

**DoD KEY TECHNOLOGY AREA:** Other (Planning Programming and Budgeting System (PPBS))

**KEYWORDS:** Budget Formulation, Budget Execution, BUPERS, PERS-02, Resource Management Office

### **THE COST AND BENEFITS OF THE NAVY NURSE CORPS ACCESSION SOURCES**

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**B.S.B.A., University of Nebraska at Omaha, 1988**

**B.S.N., Creighton University, 1992**

**Master of Science in Management-December 1999**

**Advisor: William R. Gates, Department of Systems Management**

**William D. Hatch, Department of Systems Management**

The study analyzes the various Navy Nurse Corps accession sources' costs and benefits. The study also uses a logistic regression to model "success." Success is defined as the ability to retain past initial obligation or the five-year point. Specific accession sources examined are the Naval Reserve Officer Training Corps (NROTC), Nurse Commissioning Program (NCP), Medical Enlisted Commissioning Program (MECP), direct procurement, and previous programs such as the Health services Commissioning Program (HSCP), Baccalaureate Degree Completion Program (BDCP), and Full-Time Out-Service Training (FTOST). Cohort files for FY 1992, 1993, and 1994 were developed from Navy Officer Master Files maintained at the Defense Manpower Data Center (DMDC), and the Naval Medical Information Management Center's (NMIMC) Bureau of Medical Information System (BUMIS) database. The findings indicate that both males and individuals that entered the NC through the MECP were more likely to retain. The NROTC program costs \$86,000, the most expensive source, and has the lowest retention rate, 47.1 percent. The MECP costs \$74,781 and has the best retention rate, 90.2 percent. The NCP costs \$30,045 and has a 61.2 percent retention rate.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Manpower Supply, Retention, Recruiting, Accession Sources, Nursing

### **STUDY OF THE U.S. NAVY'S PHILIPPINES ENLISTMENT PROGRAM, 1981-1991**

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**B.S., University of the State of New York, 1988**

**M.S., Hawaii Pacific University, 1993**

**Master of Science in Management-June 2000**

**Advisors: Mark J. Eitelberg, Department of Systems Management**

**Cary A. Simon, Department of Systems Management**

This thesis examines the U.S. Navy's Philippines Enlistment Program (PEP) and its possible reestablishment. The study reviews the 100-year history of U.S.-Philippine relations, including participation in the two World Wars. The U.S. Navy recruited approximately 35,000 Filipinos under PEP between 1952 and 1991, when the program ended. Special data files were constructed for the study by the Defense Manpower Data Center in Monterey, California. Approximately 3,600 Filipinos were then compared to a sample of 250,241 other Navy recruits over the period from 1981 through 1991 in the following main areas: educational attainment prior to enlistment, Armed Forces Qualification Test (AFQT) scores, continuation and promotion rates, and separation characteristics. Results show that PEP recruits, when compared as a group with the sample of other Navy recruits, have: higher educational attainment prior to enlistment; higher AFQT mean scores; higher short-term and long-term continuation rates; more rapid promotion rates; and relatively fewer separations for adverse reasons. The study concludes that PEP was highly successful in recruiting "ideal" members of the U.S. Navy, based on the selected criteria. It is recommended that action be taken to assess the possible reestablishment of the U.S. Navy's Philippines Enlistment Program.

**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training

**KEYWORDS:** PEP, Recruiting and Retention, Philippine-U.S. History

### **INNOVATING THE STANDARD PROCUREMENT SYSTEM THROUGH ELECTRONIC COMMERCE TECHNOLOGIES**

**Stephen P. Mangum-Captain, United States Marine Corps**

**B.S., University of Utah, 1991**

**Master of Science in Management-December 1999**

**Advisors: Mark Nissen, Department of Systems Management**

**CDR Jeffrey R. Cuskey, USN, Department of Systems Management**

The Standard Procurement System (SPS) is the next generation of procurement application software designed to link acquisition reform and common DoD procurement business processes with commercial best practices and advances in electronic commerce. When fully implemented, it will serve more than 1,100 sites worldwide and be employed by over 44,000 professionals. This research examines the SPS and emerging electronic commerce technologies that are revolutionizing the business industry today. Through a literature review and interview process, an analysis of the SPS along with Ariba Inc., a commercial paperless contracting venture, and leading intelligent agent software applications in e-commerce, is presented. Innovation analysis is applied to the data gathered from the research to develop a new process design. As analysts predict that by 2003, business to business e-commerce will grow to \$1.3 trillion and 95% of business industry is going to go to paperless procurement, only an aggressive implementation of innovative technologies today will prepare SPS for the procurement needs of tomorrow. It is to this end that this research is conducted, with the intent of fostering innovative change in the SPS.

**DoD KEY TECHNOLOGY AREA:** Other (Contracting)

**KEYWORDS:** Standard Procurement System, PD2, Ariba Inc., Intelligent Agents

**THE MISSING PIECE OF ACQUISITION REFORM: ECONOMIC INCENTIVES**

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**Master of Science in Management-December 1999**

**Advisors: David R. Henderson, Department of Systems Management**

**Shu S. Liao, Department of Systems Management**

This thesis explores the role of economic incentives in the Federal bureaucracy and the impact these incentives have on achieving and sustaining acquisition reform initiatives. The thesis uses economic theory to demonstrate that Government bureaucrats act in their own self-interest to maximize their agencies' budgets, and have little or no incentive to reduce costs. Previous DoD acquisition reform efforts minimized or ignored the overarching importance of these incentives while attempting to treat the symptomatic problems. The National Performance Review has attempted to incorporate incentive structures by decentralizing decision-making authority and fostering initiative and innovation in the Federal workforce. The NPR's politically expedient focus on cost savings and personnel reductions, however, has undermined its ability to gain support among Government employees who perceive no tangible economic gain from embracing these reforms. New Zealand has implemented a comprehensive public sector reform program that emphasizes and incorporates economic incentives in the organizational structure, including decentralized resource allocation authority and accountability. Though the United States' political and bureaucratic systems create significant obstacles to adopting a comparable program, it is in the Country's best interest to incorporate economic incentive structures and accountability features within existing strategic management programs.

**DoD KEY TECHNOLOGY AREA:** Other (Acquisition and Contracting)

**KEYWORDS:** Acquisition Reform, Acquisition Policy and Strategy

**INNOVATION OF THE NAVAL POSTGRADUATE SCHOOL'S STUDENT THESIS RESEARCH  
PROCESS THROUGH KNOWLEDGE MANAGEMENT**

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**Master of Science in Information Technology Management-September 2000**

**and**

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**Mark E. Nissen, Department of Systems Management**

This thesis examines the student thesis research process at Naval Postgraduate School (NPS), Monterey, CA. Research in the academic environment by Leavitt (1965), Davenport (1993), and Nissen (1998), makes a case for the integration of information technology (IT) with the process it supports. This thesis examines how the NPS population discovers and shares knowledge in the thesis research process. Additionally, it analyzes how a knowledge management (KM) tool such as a knowledge portal might improve the thesis research process. This thesis explores the culture of knowledge sharing and knowledge hoarding in the academic environment of NPS. This thesis also investigates the relevancy of student theses to Navy needs and how this relevancy might be enhanced through a knowledge portal (KP).

The findings indicate that the student thesis process at NPS can be innovated through a KM tool such as a KP. Development and implementation of the KP must be executed using an iterative, integrated approach through gradual addition of resources, functionality, and user groups. Weaknesses identified in the current thesis process require re-engineering efforts. Finally, the differences in the academic and military cultures at NPS must be minimized for successful innovation to occur.

**DoD KEY TECHNOLOGY AREA:** Computing and Software

**KEYWORDS:** Knowledge, Knowledge Management (KM), Knowledge Portal (KP), Thesis, Research, Process Innovation, Re-Engineering, Qualitative Analysis, Culture, Amalgamated KM Life Cycle Model

**UNITED STATES MARINE CORPS (USMC) KC-130J TANKER REPLACEMENT  
REQUIREMENTS AND COST/BENEFIT ANALYSIS**

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**Associate Advisor: Keebom Kang, Department of Systems Management**

NAVAIR funded a research project to answer the question: how many KC-130Js Aerial Refueling Tankers will the U.S. Marine Corps (USMC) need to meet their future wartime requirements? This thesis supports that study. Thesis results were incorporated into the recently completed Marine KC-130 Requirements Study, by Professors Gates, Kwon, Washburn, and Anderson.

Specifically, the thesis focuses on the tradeoffs the USMC faces between requirements, performance, and life-cycle costs. The KC-130J aerial refueling requirement must support expected USMC fixed-wing refueling demand during two nearly simultaneous major theater wars. Furthermore, refueling capacity must keep the average time an aircraft waits in the aerial refueling queue ( $CT_q$ ) below five minutes. To define the tradeoff between the KC-130J requirement and system performance (waiting time), the thesis develops a Simulation Model using the ARENA© simulation language. The simulation model highlights the impact of capacity failures (refueling drogues and hoses) and overlaps between KC-130J sorties, two potentially significant factors that can't be explored with standard static queuing theory models. Next, the thesis develops a Life Cycle Cost (LCC) Model that incorporates cost variability using the Crystal Ball EXCEL© spreadsheet add-on. The model defines the tradeoffs between LCC and KC-130J fleet size. The resulting analysis and conclusions specify a base-case KC-130J requirement and discuss the tradeoffs between the requirement, life cycle cost and system performance.

**DoD KEY TECHNOLOGY AREAS:** Air Vehicles, Modeling and Simulation

**KEYWORDS:** Queuing Theory, Modeling and Simulation, Life Cycle Cost (LCC) Spreadsheet Model, KC-130J, Drogue, Probe, Cost/Benefit Analysis

**A CASE STUDY: ACQUISITION REFORM AND THE JOINT PRIMARY AIRCRAFT  
TRAINING SYSTEM (JPATS) PROGRAM**

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Defense Acquisition Pilot Programs (DAPPs) were established to jump-start the initiatives outlined in the Federal Acquisition Streamlining Act (FASA) of 1994. DAPPs were provided legislative authority to implement the provisions of FASA before they were published in regulations, authority to use the commercial item exemptions for non-commercial items and were also given expedited deviation authority from the FAR/ DFARS and the DOD 5000 series regulations.

The Joint Primary Aircraft Training System (JPATS) was designated a pilot program by the Deputy Under Secretary of Defense for Acquisition Reform. The purpose of this paper is to provide insight into the Joint Primary Aircraft Training System (JPATS) acquisition and describe, if any, the results of acquisition reform on program effectiveness, cost, schedule, and performance.

Eleven metrics were established by the JPATS program and then measured against established baseline programs to derive quantitative savings attributed to implementing acquisition reform. An

analysis of those metrics concludes acquisition reform is having mixed results on this program. Only two measures seem successful indicators of acquisition reform, while the remaining nine seem to indicate more success is being realized from applying acquisition program management reform efforts highlighted in DOD directives than statutory and regulatory relief provided DAPPs.

**DoD KEY TECHNOLOGY AREA:** Other (Acquisition Reform)

**KEYWORDS:** Acquisition Reform, Major Weapon Systems, Acquisition Streamlining

### **ANALYSIS OF THE THEATER HIGH ALTITUDE AREA DEFENSE (THAAD) MISSILE TEST AND EVALUATION PROGRAM**

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This thesis is an examination of the Theater High Altitude Area Defense (THAAD) flight testing program and procurement practices. The proliferation of weapons of mass destruction, and the growing number of nations seeking to develop or purchase ballistic missiles as delivery vehicles make the development of THAAD a top DoD priority. The speed development, significant political pressure has been applied to rapidly develop and field an effective theater missile defense system. However, significant difficulties have been encountered in the development of THAAD that have delayed the program by nine years and pushed fielding of the system out to 2007. THAAD has suffered failures in seven out of eleven test flights due to quality control deficiencies which are not related to the demands of developing hit-to-kill missile technology. Repeated test failures, and schedule slippages have brought the program under close DoD and congressional scrutiny. The reasons for these system development and testing problems are analyzed, and recommendations are made on methods that may prevent these types of difficulties in future high risk weapons systems development efforts.

**DoD KEY TECHNOLOGY AREAS:** Space Vehicles, Chemical and Biological Defense, Battlespace Environments

**KEYWORDS:** THAAD Testing and Procurement

### **MANAGEMENT OF ORGANIZATIONAL CHANGE: THE CASE OF HUNGARIAN AUTOMATION AND RADAR DEPARTMENT**

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**Dan C. Boger, Department of Computer Science**

Nowadays, military decisionmakers are forced to spend more and more resources on planning and managing organizational change. In order to avoid failure, managers have to diagnose the needs of the organization, to analyze the appropriate method for change and to manage the planned change process. This thesis overviews different approaches and theoretical frameworks applicable to system assessment and diagnoses. The thesis applies the McCaskey model, the organizational system framework, to the case of the Hungarian Institute of Military Technology Automation and Radar Department. It diagnoses the department's status, identifies the gap between the actual and desired status, and it analyses the conducted changes in 1996 and the following years. The thesis concludes with recommendations for improving the management of organizational changes in general.

**DoD KEY TECHNOLOGY AREA:** Command, Control, and Communications

**KEYWORDS:** Assessment, Diagnoses, Management, Organization, Change

**THE BALKANS AT THE TURN OF CENTURY: CHALLENGES FOR GREECE AND  
EUROPEAN SECURITY INSTITUTIONS**

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The changes that occurred in the Balkans since 1991, following Soviet Union's dissolution and the breakup of Yugoslavia, revived the violent history of the Balkan Peninsula. The Kosovo War in 1998 aggravated the situation and increased fears among countries in the region for more ethnic strife, military operations and a massive exodus of refugees. As a Balkan country, Greece was affected by the evolving situation, which was reflected in its foreign security policy towards its northern neighbors during the 1990s. Greece has to redefine its role in the area and make use of its membership in both the North Atlantic Treaty Organization (NATO) and European Union (EU) to facilitate stability in the Balkans and solve its security dilemmas with its northern neighbors.

Security concerns reflect both the defense and economic aspect international relations. Political and economic stability are the primary goals of the Balkan states. These states cannot solve their problems without external help from Western European countries and European security institutions, like the EU, NATO and Organization for Security and Cooperation in Europe (OSCE). Inevitably the European security institutions' engagement in the Balkans raises questions of enlargement in the Balkans. However, enlargement for both EU and NATO involves more than simply accepting new members.

**DoD KEY TECHNOLOGY AREA:** Other (Regional Studies, Balkans)

**KEYWORDS:** Balkans, Economics and Security, Greece's Security Concerns, EU, NATO, OSCE

**THE PROGRAMMING AND BUDGETING PROCESSES OF THE UNITED STATES  
MARINE CORPS: AN INVESTIGATION INTO THEIR EFFICIENCY**

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**James M. Fremgen, Department of Systems Management**

The current Planning, Programming and Budgeting System (PPBS) consists of complex, overlapping phases that require a great deal of time and manpower to complete. More efficient PPBS processes could possibly reduce the time and manpower needed to complete these phases. The purpose of this thesis was to determine if the programming and budgeting processes of the United States Marine Corps could be more efficient. This issue was addressed in three steps. First the programming and budgeting processes were reviewed in detailed. Second, the legal requirements for each process were determined. Finally, each process was analyzed for duplication, value added, and timing of the elements of the process. The research resulted in two recommendations that could possibly increase the efficiency of the Marine Corps Programming Process. One, the Commandant's Initial Programming Guidance should be issued each year to provide the intent of the senior leader of the Marine Corps for program development. Second, the Marine Corps should consider combining the Assistant Commandant of the Marine Corps Committee brief with the brief to the Commandant to save time and effort. The research revealed that the requirement for the President to submit his budget to Congress by the first Monday in February drives the budgeting process. This requirement severely inhibits the ability to change the current process.

**DoD KEY TECHNOLOGY AREA:** Other (Financial Management)

**KEYWORDS:** Planning, Programming, and Budgeting System, PPBS, Program Budgeting, Defense

**IMPLEMENTING ACTIVITY-BASED COSTING AND MANAGEMENT AT THE NAVAL  
POSTGRADUATE SCHOOL**

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**Susan P. Hocevar, Department of Systems Management**

The Naval Postgraduate School (NPS) is pursuing implementation of an Activity-Based Costing and Management (ABCM) system as a means to improve its ability to determine the costs of business operations and provide sustained support to the decision-making process. This thesis examines the implementation process of ABCM at Naval Postgraduate School (NPS) Monterey in effort to provide information to NPS leadership regarding factors that are impeding and factors that are supporting effective implementation. Once identified, specific concerns can be addressed and reasonable incentives can be offered to promote the successful implementation and institutionalization of ABCM. Semi-structured interviews were conducted with 16 senior leaders, managers, and practitioners from the three major groups at NPS (Base Support, Faculty, Academic Support) to obtain information on how the ABCM has been implemented. Questionnaires were distributed and completed by 48 implementation participants as well as the 16 interviewees. The data gathered from NPS suggest that many of the elements that the change management literature identifies as critical to successfully implementing change were only moderately present in the school's ABCM implementation (e.g., resistance management, existence of a strong champion, detailed planning, top management support). This thesis recommends NPS leadership actively manage resistance and build commitment using the outlined intervention strategies.

**DoD KEY TECHNOLOGY AREA:** Other (Shore Installation Management)

**KEYWORDS:** Activity-Based Costing and Management ABCM, Organizational Change, Diffusion of Innovations

**THREE-DIMENSIONAL SCANNING**

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**Kenneth J. Euske, Department of Systems Management**

Abstract is restricted.

**DoD KEY TECHNOLOGY AREA:** Manufacturing Science and Technology (MS&T)

**KEYWORDS:** Three-Dimensional, Scanning, Reverse Engineering, Laser, Computed Tomography, Moiré, Coordinate Measuring Machine, Rapid Prototyping

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## THESIS ABSTRACTS

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### **AN ANALYSIS OF THE EFFECTS OF PRIOR ENLISTED SERVICE ON MIDSHIPMAN PERFORMANCE, GRADUATION, AND FLEET RETENTION AT THE U.S. NAVAL ACADEMY**

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**Roger D. Little, United States Naval Academy**

This research analyzes performance at the U.S. Naval Academy (USNA) and fleet retention of Midshipmen who have prior enlisted experience in the Navy and Marine Corps. It is the primary hypothesis of this study that prior enlisted experience provides these Midshipmen with values and skills that help them overcome perceived academic deficiencies to be successful at the Naval Academy. Linear and non-linear LOGIT regression models are estimated to analyze the influence of prior enlisted experience on performance of USNA classes from 1990 through 1999 and on the fleet retention of graduates.

The performance analysis is based on data collected by Admissions to compile USNA's Candidate Multiple with additional variables to account for attributes of each individual's prior enlisted service. USNA performance was measured in terms of leadership potential (striper selection), academics, overall class standing, and graduation rates. Officer retention is depicted by retention rates to the O-4 promotion board. The results suggest that prior enlisted experience is significant in determining success at the Academy and fleet retention.

**DoD KEY TECHNOLOGY AREA:** Command, Control, and Communications

**KEYWORDS:** Systems

### **AN EVALUATION OF BOTSWANA'S ECONOMIC GROWTH**

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**Second Reader: Roger D. Evered, Department of Systems Management**

This thesis examines the critical factors that contributed to Botswana's economy moving from being among the poorest in the world to be among the fastest growing economies in the world. The study was conducted by comparing Botswana's policies to those of other African countries. Unlike most former British African colonies, when Botswana became independent in 1966, it had no infrastructure in place. African countries, save for Botswana, have rarely had sustained economic growth during their independence era. The methodology used in this thesis consisted of an analytical assessment of literature and critical synthesis of a model of economic growth relevant to Botswana. Throughout the research the focus is on how Botswana has differed from other African countries in approaching its economic development. The study found that because of political stability, sound management of the country's resources, timely changes to economic policies and appreciation of foreign aid Botswana was able to perform better than most African countries.

**DoD KEY TECHNOLOGY AREA:** Other (Military Expenditure)

**KEYWORDS:** Economic Growth, Foreign Aid, Market Economy, Economic Policy, Gross National Product



**AN ANALYSIS OF THE CIVILIAN EMPLOYEE REWARD SYSTEM IN USE AT NAVAL AIR  
WARFARE CENTER, AIRCRAFT DIVISION, PATUXENT RIVER, MARYLAND**

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**Master of Science in Management-December 1999**

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**Susan P. Hocevar, Department of Systems Management**

An incentive system should motivate employees to increase productivity and find innovative ways to control costs. In 1998, Naval Air Warfare Center, Aircraft Division, (NAWCAD) instituted a new reward system. At the request of the NAWCAD, this thesis sought to evaluate the effectiveness of the new reward system from the perspective of the employees affected by the system. The thesis examined current literature on motivation theory with emphasis on expectancy and equity theories. Focus groups and interviews with employees at Lakehurst, NJ and Patuxent River, MD were conducted. Information from the literature review, focus groups, and interviews was used to inform a questionnaire survey which was distributed to 700 employees. Analysis of the survey returns showed NAWCAD's reward system does not fully meet its potential as an effective motivational tool. For example, results suggest that increasing the average number of monetary rewards given per employee during a fiscal year, without increasing the total budget for monetary rewards, could raise employees' sense of reward system effectiveness. Increasing the number of monetary rewards given might make the system more useful for developing employee expectancy levels, developing line-of-sight between performance and reward, as well as promoting a greater sense of equity.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Civilian Employees, Rewards, Awards, Expectancy, Equity, Hygiene, Line-of-Sight, Incentives, Productivity

**THE APPLICATION SERVICE PROVIDER MARKET: A GUIDE FOR NAVY LINE MANAGERS**

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**Douglas E. Brinkley, Department of Systems Management**

This study explores the use of application service providers (ASP) as an alternative to the traditional practices of procuring, managing and maintaining software applications and the associated hardware infrastructure. The ASP model is a method of outsourcing that calls for an ASP to acquire and manage all of the hardware and software required to meet the end-user's needs. This includes all elements of support including configuration management and maintenance. The customer purchases this service on a subscription basis.

The findings show that ASPs have the potential to be a viable and financially stable solution in meeting the Navy's and the federal government's needs of reducing the complexity and cost of providing software applications. However, a cost and benefit analysis should be performed to verify the final costs prior to any implementation. Further, the enabling thin client and server-based computing technologies all show they can provide benefits for an organization interested in centrally managing and maintaining applications.

**DoD KEY TECHNOLOGY AREA:** Computing and Software

**KEYWORDS:** Application Service Provider, Outsourcing, Pricing Models, Total Cost of Application Ownership, Thin Client, Server-based Computing, Service Level Agreements, Information Systems

**RWANDESE PATRIOTIC ARMY LOGISTICS UNIT (G4) ASSESSMENT AND  
RECOMMENDATIONS FOR CHANGE**

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Cary A. Simon, Department of Systems Management**

This thesis is an organization assessment of the army G4, (the logistics department of the Rwandese Patriotic Army,) using a systems framework. The purpose of the study was to describe the current state of the organization and to determine whether the G4 is functioning efficiently and if not, then to recommend measures to improve its performance. Assessment results show a responsive organization struggling to cope with a dynamic and uncertain external environment. The organization is riddled with internal misfits and rigidities, all of which inhibit operational efficiency. The thesis suggests possible courses of action to help G4 leaders improve their service. Specific recommendations include: revision of the organization's mandate; specification of G4 mission and direction; redesign to achieve more congruence; treatment of personnel issues; and adoption of clear and inspiring goals with corresponding procedures for evaluation. Improvement efforts require active support and participation of all G4 stakeholders.

**DoD KEY TECHNOLOGY AREA:** Materials, Processes, and Structures

**KEYWORDS:** Systems, G4 Organizational Assessment

**A COMPARATIVE STUDY OF DOD AND NON-DOD ETHICS POLICIES AND PRACTICES  
IN INDUSTRY AS APPLIED TO THE NATIONAL INDUSTRIAL BASE**

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DoD is moving from industrial sectors for defense and commercial products to a common, integrated national industrial base. One of the principal objectives of DoD's acquisition reform is to open the defense market to commercial companies and technology. The purpose of this study is to examine the current ethics culture within industry and the perception of the ethical practices within the companies surveyed as well as in the industry. Specifically, this thesis focuses on the similarities and differences in the ethical environments of the Defense and the non-Defense industries. A survey was utilized to identify trends in the ethical behavior of the industry and a thorough review was conducted of the ethics policies provided by the responding companies. The research identifies significant differences and trends in the ethical environments between these two diverse industries and makes recommendations to the DoD acquisition professional to ensure an ethical environment exists when dealing with businesses not familiar with the ethical standards of DoD acquisition.

**DoD KEY TECHNOLOGY AREA:** Other (Acquisition)

**KEYWORDS:** Ethics, Acquisition, Contract Management, National Industrial Base, Defense Industrial Base

### **INITIAL COST ESTIMATE OF OUTSOURCING INFORMATION SYSTEMS TECHNICIAN UNIVERSITY**

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**Master of Science in Management-June 2000**

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This thesis provides an initial cost estimate of outsourcing the academic component of the Information Technology training pipeline, designated as Information Systems Technician (IT) University. This estimate is based on a model of sending the ITs straight from recruit training to civilian community colleges throughout the country. The model builds assumptions into the conduct of this program to facilitate relative cost comparisons between the proposal and the current program.

Final results show that it would cost almost three times as much to fund this alternative program. However, discussions of excess capacity at educational institutions and total throughput reveal benefits that may justify the increased cost of an outsourced program.

**DoD KEY TECHNOLOGY AREAS:** Computing and Software, Manpower, Personnel, and Training

**KEYWORDS:** Information Systems Technician, Information Systems Technician University, Information Technology, Education Cost Estimation

### **WHAT DO CHIEF INFORMATION INTEGRATION OFFICERS (CI<sup>2</sup>O) NEED TO KNOW AND WHAT IS THEIR ROLE?**

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As DoD and the Navy move into the 21<sup>st</sup> Century, information technologies are abounding not only in volume but also in complexity. In order to manage and leverage these technologies, there needs to be a clear vision and it must start at the very top of the DoD Enterprise. With this vision, it will then become the responsibility of the Chief Information Integration Officer (CI<sup>2</sup>O), previously known as the Chief Information Officer (CIO), at each command to implement that vision. The real challenge is determining what exactly the CI<sup>2</sup>O needs to know and the role the CI<sup>2</sup>O should play in the command. Once the requirements are identified, how do we ensure the officer's success? This thesis examines these questions. The results of a meta-analysis from a variety of studies are portrayed in a matrix which identify the critical success factors, reporting levels, roles, core competencies, education and experience to clearly define the requirements for an effective CI<sup>2</sup>O to be implemented into Navy organizations.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Navy Officers, Information Technology, Information Management, Core Competencies, Chief Information Officer

### **A FORMAL MODEL FOR RISK ASSESSMENT IN SOFTWARE PROJECTS**

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The current state of the art techniques of risk assessment rely on checklists and human expertise. This constitutes a weak approach because different people could arrive at different conclusions from the same scenario. The difficulty on estimating the duration of projects applying evolutionary software processes contributes to add intricacy to the risk assessment problem. This thesis introduces a formal method to assess the risk and the duration of software projects automatically. The method has been designed according the characteristics of evolutionary software processes such as productivity, requirement volatility and complexity. The formal model based on these three indicators estimates the duration and risk of evolutionary software processes. The approach introduces benefits in two fields: a) automation of risk assessment and, b) early estimation method for evolutionary software processes.

**DoD KEY TECHNOLOGY AREA:** Computing and Software

**KEYWORDS:** Risk Assessment, Software Engineering

### **INNOVATING OUTPATIENT PRESCRIPTION DISPENSING IN NAVY MILITARY TREATMENT FACILITIES TO IMPROVE COST PERFORMANCE**

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**Master of Science in Management-September 2000**

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**Kenneth J. Euske, Department of Systems Management**

The current environment of constrained financial resources and manpower reductions requires all organizations to make their business processes more efficient to meet the needs of their stakeholders. This thesis analyzes the potential of business process re-engineering (BPR) to dramatically improve the efficiency of the United States Navy Outpatient Pharmacy Dispensing Process (OPDP) from both a cycle time and manpower standpoint to improve customer service while controlling costs. Using the Nissen methodology and computer modeling and simulation, four OPDP process redesign alternatives are developed that have the potential of yielding order of magnitude improvements in cycle time or cost. Simulations of the OPDP demonstrate that cycle time and/or cost can be significantly reduced at Navy pharmacies by redesigning the process of filling outpatient prescriptions. The redesigned alternatives start with workflow reconfiguration to reduce the responsibilities of the patient in the OPDP, and they build on this process streamlining through the use of information technology and automation. The research concludes that the Navy OPDP can be dramatically improved by utilizing information technology, available today, to support or automate activities in the OPDP, which reduces non value added activities in the process of filling of prescriptions.

**DoD KEY TECHNOLOGY AREA:** Modeling and Simulation

**KEYWORDS:** Business Process Re-Engineering, Outpatient Prescription Process

**AN ANALYSES OF INTERNET/INTRANET INFORMATION SYSTEM  
ARCHITECTURES WITH ORACLE 8i FOR TURKISH NAVY**

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Turkish Navy has made a strategic commitment to Oracle DBMS, by making an enterprise contract with Oracle Corporation, which places Oracle DBMS at the heart of all information processing in Turkish Navy. Ten years later currently established Oracle DBMS based information systems will be legacy systems and Turkish Navy will be bound under Oracle proprietary lock-in, unless careful approach in deploying these new systems is not made.

Oracle 8i is the latest version of the Oracle Corporation's DBMS can be solution to this problem. With Oracle 8i's Java-enabling components-Object Request Broker(ORB), Java Virtual Machine(JVM), and embedded JDBC Driver- Turkish Navy have a wealth of technologies at its disposal. Turkish Navy has a choice of several programming models—PL/SQL, JDBC, SQLJ, CORBA, and EJB; and a choice of protocols—Net8 and CORBA-IIOP. Selecting model over another can be a daunting and very important task. Each model has strengths and weaknesses for a particular task.

This research surveys Oracle Java Platform and researches different development architectures with their pros and cons, and points out the direction that should be taken in order to ensure scalability, maintainability, interoperability and extensibility of the future systems which will prevent the proprietary lock-in of the certain vendors and their products.

**DoD KEY TECHNOLOGY AREAS:** Computing and Software, Other (Information System Management)

**KEYWORDS:** Oracle, Oracle 8i, Enterprise Java Beans, CORBA, Information System Architectures, Microsoft vs. Oracle, Turkish Navy, EJB, Java, PL/SQL

**MANAGING KNOWLEDGE IN THE BATTLE GROUP THEATER TRANSITION  
PROCESS (BGTP)**

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**Carl R. Jones, Information Systems Academic Group**

At a time when theater environments are frequently hostile, changing rapidly, and uncertain, the need to improve the Battle Group Theater Transition Process (BGTP) between carrier battle groups is intense. Recent developments in information technology help facilitate the transition process, but only data and information are transferred at present, not knowledge. This study provides in-depth analysis of the current BGTP being employed by the Department of the Navy (DoN) in the Arabian Gulf. The purpose of this study is to design a knowledge management system that significantly reduces carrier battle group theater familiarization periods. This study builds upon recent work that focuses on knowledge management and system design from three integrated perspectives: 1) re-engineering, 2) expert systems knowledge acquisition and representation, and 3) information systems analysis and design. This paper uses an integrated framework for knowledge process and system design. This integrated framework covers the gamut of design considerations from the enterprise process in large, through alternative classes of

knowledge in the middle, and on to specific systems in detail. This study applies the integrated framework to the BGTTP to improve process performance.

**DoD KEY TECHNOLOGY AREA:** Other (Information Technology)

**KEYWORDS:** Analysis and Design, Expert Systems, Information Systems, Knowledge Management, Re-Engineering, U.S. Navy, Information Technology

**AN ALTERNATIVE INCENTIVE SYSTEM TO IMPROVE PRODUCTIVITY AT THE  
TURKISH NAVAL SHIPYARDS**

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**Advisors: Keebom Kang, Department of Systems Management**

**William R. Gates, Department of Systems Management**

This thesis researches to identify an alternative incentive system and determine whether it is feasible to implement it at the Turkish Naval Shipyards. The purpose of the incentive system would be to help the shipyards decrease cycle time and total cost, and increase productivity and readiness. This thesis also researches to determine the structural and statutory constraints to the implementation of such an incentive system. The thesis examined the current structure, routine processes, productivity, and compensation system at the Turkish Naval Shipyards. In this thesis, Arena Simulation Software is used to simulate and analyze the current overhaul process within the shipyards. The thesis also examined the alternative incentive systems that can be implemented at the shipyards. This thesis proposes a viable incentive system for the Turkish Naval Shipyards.

**DoD KEY TECHNOLOGY AREAS:** Other (Turkish Naval Shipyards, Incentive Systems), Modeling and Simulation

**KEYWORDS:** Incentive Systems, Productivity at the Turkish Naval Shipyards, Arena Simulation Model

**AN ANALYSIS OF THE INTEGRATION OF DECISION-MAKING MODELING WITH  
STATISTICAL/QUANTITATIVE BACKGROUND FOR MASTER'S LEVEL  
ANALYTICAL COURSES**

**Murat Ozdemir-First Lieutenant, Turkish Army**

**B.S., Turkish Army Academy, 1993**

**Master of Science in Management-June 2000**

**and**

**Kadir Ozyurek-First Lieutenant, Turkish Army**

**B.S., Turkish Army Academy, 1995**

**Master of Science in Management-June 2000**

**Advisors: Shu S. Liao, Department of Systems Management**

**Keebom Kang, Department of Systems Management**

The purpose of this thesis is to integrate statistical/quantitative background material with Master's level analytical courses. This thesis first identifies the requirements for management education in terms of AACSB and NASPAA standards. Then, based on a comparative analysis of the country's top master's of business administration (MBA) programs and Naval Postgraduate School's current Systems Management (SM) curricula, and a survey conducted among SM faculty members, it integrates the decision-making modeling with statistical/quantitative background material for master's level analytical courses. The structure of the MS in Management at NPS, while satisfying the requirements of both AACSB and NASPAA, is similar to the top management schools' MBA programs in the United States. However, top management schools' statistical/quantitative course sequence generally has four courses, providing more statistical/quantitative background material than those three of NPS. Additionally, the contents of these

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## THESIS ABSTRACTS

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three courses are not offered in adequate depth and some topics are duplicated. The new sequence and the contents of these courses are proposed based on a survey conducted among SM faculty members.

**DoD KEY TECHNOLOGY AREA:** Other (Graduate Management Education)

**KEYWORDS:** Graduate Management Education, Master of Business Administration, Statistical/Quantitative Background Material

### **INVENTORY MANAGEMENT OF REPAIRABLES IN THE U.S. MARINE CORPS - A VIRTUAL WAREHOUSE CONCEPT**

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**B.A., University of Oklahoma, 1994**

**Master of Science in Management-June 2000**

**Advisors: Kevin R. Gue, Department of Systems Management**

**Keebom Kang, Department of Systems Management**

The 1998 Department of Defense (DoD) Logistics Strategic Plan directed a sweeping program to reform the “business” of the DoD. A key component of the plan is that inventories be established at the lowest possible levels and be positioned to permit rapid delivery to the customer. In response, the Marine Corps has established a “virtual float” concept that seeks to reduce inventory levels for secondary repairables (SecReps). We show through a simulation model that the Marine Corps should not expect large savings from a virtual float operating with a lateral transfer inventory policy. For the items we selected, additional transportation costs for lateral transfers almost entirely eliminated savings due to reduced inventory. We also address organizational issues involved with a centralized system.

**DoD KEY TECHNOLOGY AREAS:** Other (Inventory, Logistics, Distribution), Modeling and Simulation

**KEYWORDS:** Inventory, Logistics, Transportation, Repairables, Simulation, Supply Chain Management

### **A COST BENEFIT ANALYSIS OF THE DEPOT MODIFICATION FIELD TEAMS FOR THE T-45C AIRCRAFT**

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**Master of Science in Management-June 2000**

**Advisors: Donald R. Eaton, Department of Systems Management**

**Jerry L. McCaffery, Department of Systems Management**

This thesis focuses on the current procedures for implementing the depot modifications on the T-45 training aircraft located at NAS Meridian, MS used by the Navy to train its Student Naval Aviators. Using cost-benefit analysis, it analyzes the feasibility of performing the modifications at the existing Contractor Depot Field Team site at NAS Kingsville, TX or standing up an additional mod line at NAS Meridian, MS. The analysis demonstrates the savings for the Navy available by expanding the existing mod line at NAS Kingsville, TX without sacrificing any readiness for the T-45 aircraft.

**DoD KEY TECHNOLOGY AREA:** Other (Cost-Benefit Analysis)

**KEYWORDS:** Depot Level Maintenance

### **THE CONDUCT AND ASSESSMENT OF A2C2 EXPERIMENT 7**

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**Master of Science in Systems Technology-September 2000**

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Academic Group**

**Susan P. Hocevar, Department of Systems Management**

Adaptive Architectures for Command and Control (A2C2) Experiment 7 is the latest in the series of experiments designed to investigate the effects of modifying current military organizational structures. It is a continuation of A2C2 Experiment 4, which compared the performance of a mission-optimized architecture to a non-optimized traditional architecture. The focus of A2C2 Experiment 7 involves the introduction of complex, unexpected tasks requiring multi-node coordination into the simulation scenario, and the examination of two disparate command and control architectures in dealing with these unexpected tasks. The two architectures, by design, differed in the amount of coordination required to accomplish the known scenario mission tasks. The "Autonomous" optimized architecture's design emphasized inter-nodal autonomy in performing mission tasks, while a "Interdependent" non-optimized architecture, resembling a traditional Joint Task Force (JTF) organization, operated with greater "inter-nodal" coordination. The research team expected the non-optimized architecture to have an advantage over the optimized architecture when dealing with the complex unexpected tasks, due to the higher coordination practiced in the "Interdependent" architecture. The experiment used the accuracy and latency scores of accomplishing each unexpected task as the two primary measures examined. A detailed statistical analysis is performed on the measures and the results discussed.

**DoD KEY TECHNOLOGY AREA:** Command, Control and Communications

**KEYWORDS:** Adaptive Architectures for Command and Control (A2C2)

### **AN EMPIRICAL ANALYSIS OF THE PHYSICAL APTITUDE EXAM AS A PREDICTOR OF PERFORMANCE ON THE PHYSICAL READINESS TEST**

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**B.S., United States Naval Academy, 1992**

**Master of Science in Leadership and Human Resource Development-June 2000**

**Advisors: Gregory G. Hildebrandt, Department of Systems Management**

**David W. Armstrong, National Naval Medical Center**

The Physical Aptitude Exam, administered to candidates in the Naval Academy admissions process to measure physical aptitude, consists of pullups for men or the flexed arm hang for women, a 300-yard shuttle run, a standing longjump, and a kneeling basketball throw. The Physical Readiness Test, administered semi-annually to all naval personnel including Midshipmen, consists of modified situps, pushups, and a 1.5-mile run. The purpose of this research is to determine if the Physical Aptitude Exam predicts performance on the Physical Readiness Test. Naval Academy Midshipmen data from the classes of 2002 and 2003 are analyzed to determine if the Physical Aptitude Exam, taken sometime during the application process, predicts performance on the Physical Readiness Test taken during the fall semester of the Midshipman's plebe year. This study uses logit and linear regression analysis to identify two significant explanatory variables; pullups/flexed arm hang and shuttle run, which predict Physical Readiness Test performance. Recognizing the factors that predict performance on the Physical Readiness Test may not only increase the number of Midshipmen who pass the Naval Academy's fitness test, but also identify candidates at risk of failing the Physical Readiness Test when they become Midshipmen.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Physical Fitness, U.S. Naval Academy, Physical Aptitude Exam, Physical Readiness Test



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## THESIS ABSTRACTS

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### **A SURVEY OF PUBLIC WORKS MANAGEMENT SYSTEMS IN CALIFORNIA CITIES**

**Vincent J. Perry, Jr.-Lieutenant, United States Navy**

**B.S., Maine Maritime Academy, 1993**

**Master of Science in Management-March 2000**

**Advisors: William J. Haga, Department of Systems Management**

**Kenneth J. Euske, Department of Systems Management**

This thesis presents the results of a survey of public works management systems used to control resources utilized for real property maintenance and repair and equipment maintenance under the responsibility of public works departments. The survey attempted to find out what management systems public works directors use to prioritize resources, control work, schedule long-range planning, and increase productivity. The results of the survey offer solutions that will help public works directors and shore installation survey offer solutions that will help public works directors and shore installation managers choose successful management systems to control costs, work, and resources.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Management Systems, Public Works, Shore Installation Management

### **AN ANALYSIS OF THE EFFECTS OF PERSONAL BACKGROUND CHARACTERISTICS AND MARKET DEMOGRAPHICS ON RECRUITER PRODUCTIVITY**

**Robert N. Plantz-Major, United States Marine Corps**

**B.S., United States Naval Academy, 1987**

**Master of Science in Management-March 2000**

**Advisors: Stephen L. Mehay, Department of Systems Management**

**Michael D. Cook, Department of Systems Management**

In the current economic and social climate, recruiting young men and women into the armed services has become increasingly difficult. The purpose of this thesis is to examine the effects that individual recruiter background characteristics and recruiting station demographic characteristics have on recruiter productivity. This thesis used data on Navy and Marine Recruiters from fiscal years 1995-99 obtained from the DMDC MEPCOM file. This file was then matched to county level demographic information for the statistical analysis. Multivariate regression models were used to determine the estimated effects of personal background characteristics and station demographics on recruiter productivity for each service. The results of the analysis showed that there were significant differences in effects of the explanatory variables between the services. Recruiter production in the Navy was most affected by the NRD dummy variables, whereas recruiter production in the Marine Corps was most affected by county demographic variables.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Recruiting, Recruiter Production, Recruiter Learning Curves

### **AUTOMATED TOOL FOR ACQUISITION PROGRAM MANAGEMENT STUDENTS (ATAPMS)**

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**Advisors: Keith F. Snider, Department of Systems Management**

**John S. Osmundson, Command, Control, Communications, Computers, and Intelligence Academic Group**

This thesis explores the top-level requirements for an Automated Tool for Acquisition Program Management Students (ATAPMS) that is designed to enhance training and education in the acquisition management field. The Department of Defense (DoD) has identified the education and training of the

acquisition workforce as a strategy to help make the acquisition system more effective and efficient. As a result, the DoD established the Defense Acquisition University (DAU) to provide the required education and training. More recently, EO 13111 and the Defense Reform Initiative have presented a mandate for the DoD to find ways to use technology to further this strategy.

Currently, the consortium schools of the DAU are using emerging technologies to increase access to their courses. However, the DAU curricula lack automated acquisition management training programs that allow instructors to qualitatively assess students' work.

This thesis recommends a set of top-level requirements for an automated program that are in compliance with the Advanced Distance Learning Initiative. It then illustrates through a prototype module, using a commercial authoring tool, how an ATAPMS can assist the DAU instructors teach the critical aspects of Acquisition Program Management.

**DOD KEY TECHNOLOGY AREAS:** Computing and Software, Manpower, Personnel, and Training, Other (Acquisition)

**KEYWORDS:** Acquisition Program Management, Acquisition Reform, Defense Reform Initiative, DRI, Advanced Distance Learning Initiative, ADL, Authoring Tool, Computer Based Training

### **APPLICATION OF CORPORATE OUTSOURCING METHODS TO THE DEPARTMENT OF DEFENSE**

**William C. Power-Lieutenant Commander, United States Navy  
B.A., Bard College, 1983**

**Master of Science in Management-June 2000**

**Advisor: Kenneth J. Euske, Department of Systems Management  
William J. Haga, Department of Systems Management**

In the face of the growing application of outsourcing, the Department of Defense lacks a methodology to assess which organizational functions ought to be outsourced. Without such a methodology, The Department of Defense is likely to misapply resources in outsourcing efforts. This thesis examines the outsourcing policies and practices of two U.S. corporations to provide lessons and models for use developing a methodology for Department of Defense activities to assess feasibility for specific outsourcing initiatives.

**DoD KEY TECHNOLOGICAL AREA:** Other (Outsourcing)

**KEYWORDS:** Outsourcing, Core Competencies, Contract Services

### **RE-ENGINEERING THE MARINE CORPS RIFLE RANGE**

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**Master of Science in Information Technology Management-June 2000**

**Advisors: Erik Jansen, Department of Systems Management  
Rex A. Buddenberg, Information Systems Academic Group**

With no significant changes in the design of rifle ranges in more than 100 years, the current range systems are not keeping pace with technological advancements. The Marine Corps rifle ranges are manpower and material intensive, requiring unit commanders to lose personnel to the training evolution for extended periods of non-productive time. Manual target operation, excessive transition time, and extra duties all contribute to eight to ten hours per day to accomplish one hour of live-fire training per individual Marine. Marines must remain at the range to act as scorekeepers, target makers, and/or target operators when not assigned to shoot. The design and implementation of an automated range system with capabilities specifically designed to operate, score, mark, and maintain targets would reduce the non-productive time a Marine spends on the rifle range. Results from this comparative analysis indicate that the automated range

would reduce man-hours by seventy-five percent. Furthermore, the implementation of computerized technology will enable instructors and shooters to better analyze each training evolution.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Information Technology, Process Re-Engineering, Marksmanship, and Training

### **AUTOMATING AVIATION TRAINING RECORDS**

**Kurt B. Reinholt-Lieutenant Commander, United States Navy**

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**Master of Science in Information Technology Management-September 2000**

**Advisors: Rex A. Buddenberg, Information Systems Academic Group**

**William J. Haga, Department of Systems Management**

Over the years with advances in computer technology, the Navy has gradually transitioned into a paperless operation. Personnel training records have provided a standardized, documentable individual qualification record for Navy aviation maintenance personnel, however, these records continue to be kept in folders, stored in file cabinets. In addition, paper records create a maintenance burden, in that continued handling and possibility of errors made during data entry and normal wear and tear of documents contained in these records, require pages to be periodically repaired, replaced or completely recreated. A torn and missing page also causes valuable training information to become lost, decreasing the information integrity of the record.

This thesis will examine the benefits and problems in automating aviation training records, and further discuss database design issues and considerations to maximize the flexibility and functionality provided by automation. Incorporating a distributed database is discussed as a solution, with further discussion on further considerations for the proper implementation of a training record database. Interface and alternate local networking options will also be discussed. Recommendations for further research is also presented.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Distributed Database, Training, Automation, Paperless, Records, Network Database System

### **GUIDANCE FOR TRANSITIONING TO PERFORMANCE-BASED SERVICE CONTRACTING - A GUIDE FOR DEPARTMENT OF DEFENSE FIELD CONTRACTING ACTIVITIES**

**Michael L. Renegar-Lieutenant, United States Navy**

**B.S., United States Naval Academy, 1990**

**Master of Science in Management-June 2000**

**Advisor: CDR David A. Smith, USN, Department of Systems Management**

**William R. Gates, Department of Systems Management**

The objective of this thesis is to assess the transition from traditional service contracting to performance-based service contracting at Department of Defense Field Contracting Activities. There has been an increase in spending on services over the past decade that has forced the Federal Government to review its policy on service contracting. In 1991, the Office of Federal Procurement Policy established policy for the acquisition of services using performance-based contracting. Interviews of Government contracting personnel and review of professional literature highlight barriers to performance-based service contracting. These barriers are: management of cultural change, education and training of Government and contractor personnel, adoption of best commercial practices, writing of performance-based statements of work, and the tasks involved in contract administration. This thesis makes recommendations for overcoming these barriers and provides guidance for successful implementation of performance-based service contracting within the Department of Defense.

**DoD KEY TECHNOLOGY AREA:** Other (Acquisition and Contract Management)

**KEYWORDS:** Service Contracting, Performance-Based Service Contracting (PBSC), Field Contracting Activities, Acquisition

**AN ASSESSMENT OF THE SENIOR ENLISTED LEADER PROGRAM AT THE UNITED STATES NAVAL ACADEMY**

**David K. Richardson-Lieutenant, United States Navy  
B.S., United States Naval Academy, 1995**

**Master of Science in Leadership and Human Resource Development-June 2000**

**Advisors: Alice M. Crawford, Department of Systems Management**

**Gail F. Thomas, Department of Systems Management**

This thesis is an assessment of the Senior Enlisted Leader Program at the United States Naval Academy. Specifically, this thesis documents the background and presents an assessment of the program. The author conducted 34 focused interviews--four of these interviews were conducted with key personnel involved in the founding and implementation of the Senior Enlisted Leader Program in its early years. The other 30 interviews were conducted with the 30 current Senior Enlisted Leaders to gain insight into the current operation of the program from their perspective. The data analysis yielded eight themes related to the Senior Enlisted Leader Program. Six of these themes present positive aspects of the program, and two of these themes address areas for improvement. Overall, the data suggest that the Senior Enlisted Leader Program has had a significant positive impact on the leadership development of Midshipmen and the Naval Academy as a whole.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Leadership, Leadership Development

**ANALYSIS AND EVALUATION OF CURRENT CHALLENGES IN THE AEROMEDICAL EVACUATION MISSION SEGMENT OF THE CIVIL RESERVE AIR FLEET**

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**Masters of Science in Management-March 2000**

**Advisors: Ira A. Lewis, Department of Systems Management**

**Lee Edwards, Department of Systems Management**

The Civil Reserve Air Fleet (CRAF) is a contractual arrangement between Air Mobility Command (AMC) and U.S. air carriers. The agreement states that the airlines will commit a specified number of planes to amc in return for a portion of peacetime government business. The Aeromedical Evacuation (AE) segment of CRAF is the only segment that requires modification to committed aircraft and, therefore, more risk to the airlines. Up until fiscal year 2000, AMC had never filled its requirements for AE.

AMC would like to have more airlines join the AE segment, with each airline providing a few aircraft. This thesis considers the history of the program, lessons learned from previous operations, current strategies, and some alternatives to investigate in order to improve the CRAF AE program and participation by the airlines.

**DoD KEY TECHNOLOGY AREA:** Other (Civil Reserve Air Fleet, Aeromedical Evacuation)

**KEYWORDS:** Civil Reserve Air Fleet, Aeromedical Evacuation, Aeromedical Evacuation Ship Set, Liquid Oxygen Support System, Department of Transportation Office of Emergency Transportation

### **GUIDANCE FOR ARMY CONTINGENCY CONTRACTING OFFICERS IN PREPARATION FOR MILITARY OPERATIONS OTHER THAN WAR**

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**B.S., United States Military Academy, 1991**

**Master of Science in Management-March 2000**

**Advisors: LTC Brad R. Naegle, USA, Department of Systems Management**

**Susan P. Hocevar, Department of Systems Management**

The purpose of this study is to investigate, analyze, and promulgate the means by which the United States Army can effectively train its Contingency Contracting Officers in preparation for Military Operations Other Than War. This was accomplished by analyzing the literature on effectiveness of current laws and regulations governing contingency contracting and the lessons learned from past operations. Contingency contracting issues analyzed include their fundamental characteristics and effects, purpose of the Contingency Contracting Officers and their requisite roles and responsibilities, environment of statutory and regulatory requirements, adequacy of current training and planning, and training and planning resources that are available. Based on the identified inadequacies, this study proposes the following recommendations. The Contingency Contracting Officers must be more actively engaged in the supported unit's logistics planning process. Each contracting activity must develop its own tailored qualification and certification. To fully capitalize on the capabilities of contingency contracting support functions, the CCOs, FOOs, CORs, and Class A Agents must be trained routinely before the actual deployments. Comprehensive contracting procedures and plans must be developed and incorporated into the contracting support plan. To better utilize the Logistics Civil Augmentation Program, a clearer understanding of its capabilities must be developed and communicated to the operational commanders and their staff officers.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Contingency, Contracting, Contingency Contracting, Training, Planning

### **AN ANALYSIS OF OUTSOURCING OF INSTALLATION SERVICES UNDER OFFICE OF MANAGEMENT AND BUDGET (OMB) CIRCULAR A-76**

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**B.A., Central Washington University, 1990**

**Master of Science in Management-December 1999**

**Advisors: Lawrence R. Jones, Department of Systems Management**

**CDR Jeffrey R. Cuskey, USN, Department of Systems Management**

Office of Management and Budget (OMB) Circular A-76 details the process by which Government organizations manage and conduct commercial activity competitions. This research examined the requirements of OMB A-76 in terms of competitions within the Services of the Department of Defense. This research looked at the application of OMB A-76 by commands during the period FY 1994 to present. Through a survey of contracting commands within the Army, Navy, and Air Force, the researcher looked at the nature of services that were being competitively sourced. Additionally, lessons learned were collected from the commands, augmenting published lessons learned from each of the Services. Risk identification and management within the A-76 process was also examined in the survey. The goal in conducting the research was to aid Marine Corps Contracting Officers in identifying a common family of services capable of being competitively sourced. A secondary goal was the identification of significant issues that contracting officers will face when implementing OMB A-76.

**DoD KEY TECHNOLOGY AREA:** Other (Contracting)

**KEYWORDS:** Competitive Sourcing, Outsourcing, OMB A-76, Contracting

**AN ANALYSIS OF OPERATIONAL AVAILABILITY OF BRAZILIAN NAVY AND  
ARGENTINE AIR FORCE A-4 FLEETS USING SIMULATION MODELING**

**Marcelo B. Rodrigues-Lieutenant Commander, Brazilian Navy  
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**Master of Science in Management-December 1999**

**and**

**Mario Karpowicz-Major, Argentine Air Force  
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**Master of Science in Management-March 2000**

**Advisors: Keebom Kang, Department of Systems Management**

**Donald R. Eaton, Department of Systems Management**

This thesis analyzes the impact of reducing transportation cycle time and consolidating aviation electronic component inventory management on the operational availability of the Brazilian Navy and Argentine Air Force A-4 fleets. The research is based on a scenario where the Brazilian Navy operates twenty A-4 aircraft, while the Argentine Air Force operates thirty A-4s, and both countries rely on manufacturers in the United States for depot-level maintenance. The transportation turn-around-time is extremely long and the cost of some inventory items is very high. A simulation model was developed representing the repair process of a selected group of A-4 critical electronic components. This particular model provides an effective managerial resource for long-term decision making to improve the readiness of aircraft fleet for both countries. We also developed a multiple regression analysis model (metamodel) to find the relationship between spare inventory levels and the operational availability. These results were applied to a linear programming model to find optimal spare levels for these critical components by minimizing the total cost while maintaining the desirable military readiness. Through a cost-effectiveness analysis, we compared the two situations, optimal spare levels with reduced transportation time and actual spare level with current transportation time. The research concludes that both Armed Forces will improve readiness, while achieving significant savings, if they reduce the transportation time for the aviation electronic components sent to the United States for depot-level maintenance, and collaborate on the inventory management of their A-4 fleets.

**DoD KEY TECHNOLOGY AREA:** Other (Logistics)

**KEYWORDS:** Inventory Management, Operational Availability, Simulation Modeling, Transportation Costs, Aviation Depot-Level Maintenance

**AN ANALYSIS OF THE RETENTION EFFECT OF USING LUMP SUM PAYMENTS FOR THE  
U. S. MARINE CORPS SELECTIVE REENLISTMENT BONUS PROGRAM**

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**Master of Science in Management-March 2000**

**Advisors: Stephen L. Mehay, Department of Systems Management**

**John T. Warner, Clemson University**

This thesis examines the estimated effects on enlisted retention in the Marine Corps of changing the Selective Reenlistment Bonus (SRB) payment method to lump sum. The thesis surveys the literature on personal discount rates (PDR) and on models of enlisted retention. The thesis analyzes the potential effect of the payment method on retention of Zone A eligible personnel using a range of PDRs and retention elasticities estimated by the Center for Naval Analyses. The NPV of a lump sum payment was compared to that of the current payment method using the actual SRB multiples for each USMC Occupational Field. The results indicate Zone A first-term Marine retention will increase between 6.8 percent and 11.7 percent if the SRB payment were made in lump sum. The effect of switching to a lump sum payment was also analyzed using the Annualized Cost of Leaving (ACOL) model. The ACOL model estimates reinforced the estimates predicted by this thesis. Finally, a Monte Carlo simulation was run in Microsoft Excel to estimate the probabilities of attaining a given number of Marines across all Occupational Fields. The

Monte Carlo simulation runs show an increased probability of obtaining a given number of first-term Marines by changing the SRB payment method to lump sum.

**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training, Modeling and Simulation

**KEYWORDS:** United States Marine Corps, Selective Reenlistment Bonus (SRB), Personal Discount Rate, Monte Carlo Simulation, Military Manpower, Policy Analysis, Retention, First-Term Alignment Plan (FTAP)

### **AN ANALYSIS OF THE CONTRACTING PROCESS USED BY THE NATIONAL ARMED FORCE OF VENEZUELA**

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**Master of Science in Management-June 2000**

**Advisors: David V. Lamm, Department of Systems Management**

**Jeffrey R. Cuskey, Department of Systems Management**

Like many countries around the world experiencing economic problems, Venezuela is suffering from structural reforms. These reforms affect all Government institutions, including the National Armed Force of Venezuela. The Venezuelan structural reforms are based on the restructuring of the public sector, changes in social, economical and political laws, and the structuring of a new political system according to the new Bolivarian Venezuelan National Constitution.

The purpose of this thesis is to analyze the military contracting process for goods and services in Venezuela as well as to identify policies, procedures, and methodologies, contributing to the implementation of the respective contracting process. Once these indicators were identified, this thesis proposes a model procurement system as a more appropriate system in the new Venezuelan legal environment. The model procurement process is explained starting with the initial request for material through delivery to the end user.

This thesis is a practical, homogeneous and easy reference for the personnel working in the Logistic Command of the Armed Force of Venezuela due to its logical and uniform criteria in the procedures of procurement. In addition, this thesis will be a point of reference to the lawmakers in the National Assembly when they reform or modify the old legislation for acquisition and contracting.

**DoD KEY TECHNOLOGY AREA:** Other (Acquisition Management)

**KEYWORDS:** Acquisition Process, Defense Procurement, Procurement System, Legislation for Acquisition and Contract

### **TOTAL OWNERSHIP COSTS FOR THE MARINE CORPS PROCUREMENT PROGRAMS**

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**Masters of Science in Management-December 1999**

**Advisors: Joseph G. San Miguel, Department of Systems Management**

**James M. Fremgen, Department of Systems Management**

This thesis responds to Marine Corps Systems Command (MARCORSSYSCOM) Program Managers' desire to track Total Ownership Costs (TOC) for the procurement programs in the Marine Corps. DoD has adopted TOC as a means of reducing costs to generate the necessary resources for critical modernization and recapitalization. TOC serves as a strategic goal that focuses the efforts of the acquisition community on understanding Life Cycle Cost (LCC) and the support infrastructure for existing and future weapon programs. This study examined the budget process, funding flow and appropriations along with major appropriation categories, and tracking TOC in the major appropriations. Data was collected from historical accounting records, Budget Estimate Submission (BES) to Congress, and other supporting systems. The major finding of this study is that TOC may be tracked in the major appropriation categories of RDT&E

and procurement with limited administrative accounting modifications. Personnel and funding restrictions prevent actual cost for the military personnel appropriations from being attained, but estimates can be used with a reasonable degree of certainty. The operations and maintenance appropriations will continue to be the most difficult to track for TOC. However, the introduction of new accounting and supply systems, plus awareness, will improve the ability to track TOC in this appropriation.

**DoD KEY TECHNOLOGY AREA:** Other (Finance)

**KEYWORDS:** Total Ownership Costs, Marine Corps

### **AN ASSESSMENT OF THE RECRUITING STATION LOCATION EVALUATION SYSTEM (RSLES)**

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**Master of Science in Management-March 2000**

**and**

**Donald R. Wilkinson-Lieutenant, United States Navy**

**B.S., United States Naval Academy, 1991**

**Master of Science in Management-March 2000**

**Advisors: Stephen L. Mehay, Department of Systems Management**

**Michael D. Cook, Department of Systems Management**

The purpose of this thesis is to assess the effectiveness of the Recruiting Station Location Evaluation System (RSLES) optimization model developed at Naval Postgraduate School as a result of the OSD Recruiting Station Location Project. RSLES was designed to aid DOD decision-makers in determining the optimum number of recruiting stations, their geographic location and staff size. The optimization procedure attempts to maximize contract production subject to service budget constraints. This system integrates an Access database, a GAMS optimizer, and MapInfo graphics to provide a flexible environment to maximize production through market analysis and demographic information. This research applies RSLES to 39 Metropolitan Statistical Areas (MSA) under three different stationing scenarios and analyzes the output to determine the effectiveness of the model. The recommended station location actions of the RSLES model are compared to actual stationing decisions made by the Navy and Army in fiscal years 1999 and 2000. The comparisons show that applying the RSLES model could increase Army and Navy contract production by 3,938 high-quality accessions for all 256 MSA's in the U.S.

**DoD KEY TECHNOLOGY AREAS:** Manpower, Personnel, and Training, Other (Recruiting)

**KEYWORDS:** Recruiting, Manpower Supply, Site Location, Enlistment Supply

### **PEDIATRIC OUTPATIENT CLINIC MANPOWER REQUIREMENT VARIABLES AT NAVY MEDICAL TREATMENT FACILITIES**

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**Master of Science in Management-June 2000**

**Advisors: CAPT James A. Scaramozzino, USN, Institute for Defense Education Analysis**

**CDR William D. Hatch, USN, Department of Systems Management**

This thesis examines the variables that influence the determination of manpower requirements at Naval Medical Center San Diego and Naval Hospital Bremerton Pediatric Outpatient Clinics. The study reviews the military and civilian managed care program, the principles of Population Health Management, and the present medical model used by military and civilian facility to determine medical manpower requirement. The researcher sent survey questions via electronic mail to six senior medical staffs of the two Military Treatment Facilities MTF) stipulated above. The survey questions were formulated from the models of civilian medical facilities and the Joint Health Care Manpower Standards model, which were categorized



into three themes: clinic management, clinical services provided, and manpower and personnel. Theme two, “clinical services provided,” of the survey instrument and including the statistical workload data for Fiscal Year 1999 were used in the analysis. The results of this study showed that MTFs have shifted their perspective in determining and allocating medical manpower requirements to be more in unison with the civilian sector’s perspective than the military’s staffing model. Therefore, historical workload data are not ideal determinants for medical manpower requirements.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Medical Manpower Requirement Variables, Pediatric Outpatient Manpower Requirements, Joint Health Care Manpower Standards

### **STRATEGIC AND PERFORMANCE PLANS FOR SHORE INSTALLATIONS**

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**Master of Science in Management-June 2000**

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In recent years, an understanding has emerged that the federal government needs to run more efficiently and improve accountability. As companies are accountable to shareholders, the federal government is accountable to taxpayers. Under the Government Performance and Results Act of 1993 (GPRA) every major federal agency must be able to set goals, measure performance, and report on their accomplishments. The DoD and the Navy have been working to develop base management and quality standards, to improve the efficiency and improve accountability of base management. The Department of the Navy’s Strategic Plan states that Naval bases must provide high-quality services to fleet units worldwide at a level necessary to sustain both personnel morale and combat readiness. To meet GPRA requirements, realize potential fiscal savings, and ensure that the requisite levels of service are provided, measurable Navy wide performance standards for key services must be developed. This thesis examines the difficulties the Navy has had in trying to establish performance measures for their shore installations. Further, it will review current performance measurement models used in the public sector and recommend a model that best fits the Installation Core Business Model in order to aid installation commanders in meeting GPRA’s performance requirements.

**DoD KEY TECHNOLOGY AREA:** Other (Control Systems)

**KEYWORDS:** Performance Measures, Strategic Planning

### **A HISTORICAL PERSPECTIVE OF THE GLOBAL TRANSPORTATION NETWORK (GTN)**

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**Master of Science in Management-March 2000**

**and**

**David J. Trettel-Lieutenant Commander, United States Navy**

**B.S., Southwest State University, 1983**

**Master of Science in Management-March 2000**

**Advisors: Ira A. Lewis, Department of Systems Management**

**William R. Gates, Department of Systems Management**

This thesis analyzes the changes within the Global Transportation Network (GTN)/In Transit Visibility (ITV) feeder systems and the subsequent ITV they provide by comparing the current position to the past and by examining future trends. Up until now, there has been no definitive documentation showing the initial inception or the subsequent improvements that have taken place in developing the GTN and feeder systems. The inception of the GTN is documented, including some of the “proof of concept” prototypes.

The operational prototypes and production systems are also analyzed, including the feeder systems used in the GTN and how the GTN performed during operation Desert Shield/Storm. USTRANSCOM's vision of the future GTN, up to FY04, is explained along with the authors' view of possible future GTN capabilities.

**DoD KEY TECHNOLOGY AREA:** Command, Control, and Communications

**KEYWORDS:** Global Transportation Network (GTN), Intransit Visibility (ITV), Total Asset Visibility (TAV), Transportation Logistics

### **THE UNIVERSAL FUEL AT SEA: REPLACING F-76 WITH JP-5**

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**Master of Science in Management-June 2000**

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**Ira A. Lewis, Department of Systems Management**

This research investigates the feasibility, benefits, impacts and costs of replacing F-76 with JP-5 and adopting JP-5 as the single "universal fuel at sea." Joint Publication 4-03, *Joint Bulk Petroleum Doctrine* states, "Department of Defense components should minimize the number of bulk petroleum products that must be stocked and distributed." DoD currently stores and distributes two fuels, F-76 and JP-5, for shipboard use. As the universal fuel at sea JP-5 would replace F-76. All shipboard systems, including boilers, turbine engines and diesel engines that currently operate with F-76 should operate satisfactorily with JP-5. Adopting JP-5 as the single fuel stocked and distributed for shipboard use would simplify logistics support, maximize flexibility, and enhance the readiness and sustainability of U.S. forces at sea.

**DoD KEY TECHNOLOGY AREA:** Other (Petroleum Logistics)

**KEYWORDS:** Petroleum Logistics, Single Fuel Forward, Universal Fuel, Fuel Specification Standardization

### **AH-64 APACHE COST REDUCTION**

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The Total Ownership Cost Reduction (TOCR) Program was implemented to assist the Program Manager (PM) in upgrading components with significant life-cycle costs. Neither a formal database tracking system for corrosion nor a funded program for updating corrosion-susceptible parts exists. In 1996, at Hunter Army Airfield, Georgia, replacement of corroded gearboxes on the AH-64A Apache Helicopter accounted for \$1.12M, yet went unnoticed due to the lack of a comprehensive database. The Apache PM experiences difficulty in taking full advantage of the TOCR program because of application and funding uncertainties. Corrosion of the Apache's driveline components merits overhaul-procedure modifications under the TOCR program. However, the lack of database tracking and inadequate TOCR program funding discourage PM use. This thesis researches component database tracking and TOCR funding to facilitate the PMs reduction of the Apache's life-cycle costs.

**DoD KEY TECHNOLOGY AREA:** Other (Systems Management)

**KEYWORDS:** Systems, Life-cycle Cost Reduction, Aviation Maintenance, Corrosion, Total Ownership Cost Reduction (TOCR), Cost Reduction, Magnesium Gearboxes, Resin Coating, Pilot Programs

### **AN EVALUATION OF THE APPLICATION OF ECONOMIC ANALYSIS AND COST-BENEFIT ANALYSIS TOOLS IN THE DOD ENVIRONMENT**

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**Master of Science in Management-June 2000**

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This thesis reviews the application of cost-benefit analysis (CBA) in the Department of Defense (DOD) and the software and automated tools used in these applications. The thesis focuses on the analytic capabilities of the software and tools as applied to cost-benefit analysis problems in the DOD environment. The principles of cost-benefit analysis are used to evaluate the utility of the existing software applied to DOD cost-benefit analyses.

The research identifies the cost-benefit analysis automated tools used in the DOD and the regulations that apply to cost-benefit analyses in the DOD. It also lists the organizations involved in conducting CBA. By reading the list of tools and their features, readers will become aware of what is currently available in DOD to facilitate the reliability of CBA. The study also focuses on the ECONPACK software developed by the U.S. Army Corps of Engineers.

ECONPACK's strengths and weaknesses are analyzed. Also, ECONPACK is used to replicate two earlier studies – one a cost-benefit analysis of retail activities at military bases, the other a cost-effectiveness study of the operational availability of the Brazilian and Argentinean A-4 fleet. The replications demonstrate that ECONPACK is designed to support cost and cost-effectiveness analyses rather than true cost-benefit analyses.

**DoD KEY TECHNOLOGY AREA:** Other (Cost-Benefit Analysis)

**KEYWORDS:** Cost-Benefit Analysis, Discounting, Costs and Benefits Estimation, Cost-Effectiveness Analysis, Sensitivity Analysis

### **THE REGIONAL JET, CANCER OR CURE? A TREND ANALYSIS DETAILING THE EFFECTS OF THE REGIONAL JET ON THE QUALITY OF AIR SERVICE OFFERED AT SMALL COMMUNITY AIRPORTS**

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There are 201 communities across the continental United States with 50,000 or less enplanements and commercial air service being provided exclusively by turboprop or propeller driven aircraft. The character and quality of air service to these communities has been consistently changing since the airline deregulation act of 1978. The insurgence of the regional jet into the regional aviation marketplace has been the recent instigator that has changed the quality determinants of regional air service. This study determines the influence of these factors in the determination of an airport's demand for air service, to predict which of the 201 communities would most likely lose its air service. The resulting findings were that 79 of the 201 small community airports were identified as those who had a possibility of losing air service and 34 of those 79 were identified as airports most likely to lose air service in the next decade.

**DoD KEY TECHNOLOGY AREA:** Air Vehicles

**KEYWORDS:** Regional Jet, Turboprop Avoidance Factor, Turboprop, Small Community Airports, Hub Airports, Essential Air Service, Airline Deregulation Act of 1978

### **REQUIREMENTS ANALYSIS AND INFRASTRUCTURE ASSESSMENT METHODOLOGIES FOR INTRANET DEVELOPMENT**

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**Master of Science in Information Technology Management-September 2000**

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This is a study of intranet planning methodologies with specific focus on two aspects of project planning, requirements analysis and infrastructure assessment. This thesis examines both qualitative and quantitative aspects of assessing and planning for intranets. Thoroughly completing these two areas is important in order to bring success to an intranet project. This thesis examines variables necessary in each area that require consideration during planning. Chapter II is a study of requirements analysis. A three-step methodology will guide planners through a logical process that assists in creating a well-organized plan. Chapter III is a study of infrastructure assessment. Items of infrastructure are defined and listed to assist planners to assess existing infrastructures. A five-step methodology will guide planners through a logical process of assessing enterprise infrastructure. Chapter IV is a case study of the U.S. Marine Corps Collaborative Planning Network, an enterprise-wide intranet project designed to augment the existing Marine Corps Enterprise Network. Methods and processes in this case study closely parallel methods of planning recommended in this thesis. Chapter V contains a summary and recommendations. This chapter also provides recommendations for areas of further study in intranet planning.

**DoD KEY TECHNOLOGY AREAS:** Computing and Software, Command, Control, and Communications

**KEYWORDS:** Computer Networks, Intranets

### **AN ANALYSIS OF THE PLANNING, PROGRAMMING AND BUDGETING SYSTEM (PPBS) PROCESSES OF THE MILITARY SERVICES WITHIN THE DEPARTMENT OF DEFENSE**

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**Master of Science in Management-December 1999**

**Advisor: CDR Ted Hleba, USN, Department of System Management  
James M. Fremgen, Department of System Management**

This thesis analyzes the current Planning, Programming and Budgeting System (PPBS) processes used in the military services. It will provide an updated basis for further study of PPBS. The thesis provides an overview of the PPBS at the Department of Defense level and describes the practices in place for the services. In each chapter there is an examination of the PPBS organization or corporate structure for the respective service. Additionally, each chapter examines the planning phase processes to develop the programming guidance. Next is a description of the Program Objectives Memorandum (POM) development and Budget Estimate Submission (BES) formulation. Following descriptions of the practices for each of the services, there is a comparison. The comparison revealed two different methods being used by the services. The Army uses a decentralized approach for all inputs to the different processes. The Navy uses a decentralized approach for only the BES inputs and the Air Force uses a decentralized approach for only the POM inputs. The Marine Corps uses a centralized approach for all inputs. A centralized approach for review is used by all services, but at differing levels.

**DoD KEY TECHNOLOGY AREA:** Other (Finance)

**KEYWORDS:** Planning, Programming and Budgeting System, PPBS, Program Budgeting, Defense

### **THE MILITARY HOUSING PROBLEM: PUBLIC PRIVATE VENTURE (PPV) AND COMPLETE PRIVATIZATION ALTERNATIVES**

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Donald R. Eaton, Department of Systems Management**

This thesis examines the current problems facing military housing, mainly inadequate quantity and quality to meet current demand. The Secretary of Defense testified before Congress that meeting today's military housing requirements would necessitate 30-40 years of effort at a cost of approximately \$20B, if funded under the traditional Military Construction (MILCON) appropriation. This study considers the following alternatives for solving the housing problem: the current approach of MILCON; Public Private Venture (PPV); and complete privatization. Results indicate that MILCON is slow and underfunded and will not efficiently solve the housing problem. Public Private Venture may be a more efficient alternative but is also slow based primarily on legal difficulties. Complete privatization is clearly the best alternative, but this option must also overcome primarily political resistance to the traditional MILCON process. Complete privatization appears to be cheaper, more aligned with the private sector housing market, and would probably increase the Quality of Life (QoL) of all service members.

**DoD KEY TECHNOLOGY AREA:** Other (Shore Installation Management)

**KEYWORDS:** Public Private Venture, Privatization of Military Housing

### **FEASIBILITY OF STANDARDIZING AUTOMATED LABORATORY ANALYZERS ON-BOARD U.S. NAVAL SHIPS**

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**Master of Science in Management-December 1999**

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There are 75 Naval ships that have a medical laboratory aboard and laboratory technicians assigned (HM 8506-Advance Medical Laboratory Technicians) to perform testing. The purpose and function of laboratory technicians are to assist health care providers in: 1) confirming or rejecting a diagnosis, 2) providing guidelines in patient management, 3) establishing a prognosis, 4) detecting disease through case finding or screening, and 5) monitoring follow-up therapy. Currently, no shipboard laboratory is configured quite the same. Even though the testing requirements are similar, the type of instrumentation and methodology used to accomplish testing varies from ship to ship. This research provides insight into the feasibility, effects, and benefits of standardizing automated laboratory analyzers aboard Navy ships. The author examined the current doctrine, selection, procurement and provisioning of shipboard laboratories and their impacts on training and fleet medical support. The findings show the overall effect of standardizing laboratory analyzers is improved combat readiness. The concerns of medical departments that led to non-standard analyzer procurement will be alleviated with fielding of the standardized equipment. Scarce resources, including funding, shipboard warehousing and laboratory space, and training resources are maximized.

**DoD KEY TECHNOLOGY AREAS:** Biomedical, Other (Logistics)

**KEYWORDS:** Standardizing Laboratory Equipment, Automated Analyzers

### **IPSEC VIRTUAL PRIVATE NETWORKS**

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**Raymond F. Bernstein, Jr., Department of Electrical and Computer Engineering**

**Second Reader: Douglas E. Brinkley, Department of Systems Management**

In the Information Age, information itself is a weapon due to the speed of transmitting data. However, to be usable, the information must be accurate, timely, and relevant. To ensure these three basic tenets, we must have strong Information Assurance.

Internet Protocol Security Virtual Private Networks offer a standards-based solution to the problems of transmitting sensitive data across an open source extranet such as the Internet. As a security solution for computer networks, they offer a strong method for encryption and authentication. However, due to the complexity of the technology, effective implementation requires detailed understanding of the setup process and painstaking attention to detail during the setup process.

Due to the threats that abound in today's world, the overall approach to the management of the Navy's Information Technology systems must be restructured. To have a consistent and standard policy is of utmost importance, as is the training of those that must install and maintain the systems and policies.

Cisco System routers offer the hardware required to fulfill the Virtual Private Networking requirements. The framework needed to develop an overall plan for consistently employing the Information Technology systems used today can be found in the Navy Nuclear Power program.

**DoD KEY TECHNOLOGY AREAS:** Battlespace Environments, Command, Control, and Communications, Computing and Software, Electronics, Electronic Warfare, Human Systems Interface, Manpower, Personnel, and Training

**KEYWORDS:** Information Age, Information Assurance, Virtual Private Networks, Internet Protocol Security, Firewalls, Information Technology, Information Technology Management, Cisco Routers

### **KNOWLEDGE MANAGEMENT OF THE SPECIAL WARFARE AUTOMATED PLANNING SYSTEM (SWAMPS): HOW TO PROVIDE TIMELY, RELEVANT AND ACCURATE KNOWLEDGE TO THE OPERATOR DURING THE MISSION PLANNING PROCESS**

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**Master of Science in Information Technology Management-September 2000**

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**Second Reader: John C. Osmundson, Command, Control, Communications, Computers, and  
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This research evaluates the feasibility of implementing a knowledge management scheme into the Special Warfare Automated Mission Planning System (SWAMPS). The objective is to determine not only what type of knowledge is required by the operator but also how to get that knowledge to him within constraints imposed by factors such as time, location and prior experience. This research focuses on utilizing information technology, along with other enablers, to access and retrieve knowledge pertinent to the mission. This knowledge will be accessed as close to real time as possible in order to allow the operator to review the information when and where it is most relevant. Research includes conducting a detailed analysis of the applicable mission planning processes and consolidating technological, operational and human enablers to develop requirements for implementing a knowledge management architecture. Various operators are interviewed in order to clarify what knowledge needs to be presented.

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## THESIS ABSTRACTS

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**DoD KEY TECHNOLOGY AREAS:** Command, Control, and Communications, Manpower, Personnel, and Training, Other (Knowledge Management)

**KEYWORDS:** Knowledge Management, SWAMPS, Mission Support Center, MSC, Push, Naval Special Warfare, NSW, Mission Planning

### AN ECONOMIC ANALYSIS OF THE AEROMEDICAL EVACUATION, PATIENT MOVEMENT ITEMS PROGRAM

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This research examines the Air Force Aeromedical Evacuation, Patient Movement Items (PMI) Program. This thesis analyzes the primary question of cost savings or equipment deferment based on projected casualty rates. It uses a simple linear program, focused on minimizing beginning inventory, and maps an optimal order plan based on manufacturer capacity and lead time. This thesis suggest updating demand requirements for variability from projected demand using an exponentially weighted moving average calculation. This thesis illustrates that initial deferment can generate substantial savings. This thesis recommends increasing readiness capabilities and cost avoidance by implementing the deferment plan.

This thesis recommends additional areas of further research to include consolidating patient movement and inventory tracking systems and utilizing advanced simulation software to determine medical requirements in theaters of operation. These initiatives, if analyzed more thoroughly, could provide DoD policy makers clearer insight for potential system-wide savings.

**DoD KEY TECHNOLOGY AREA:** Biomedical

**KEYWORDS:** Aeromedical Evacuation Patient Movement Items

### METRICS FOR MONITORING SECTION 845 "OTHER TRANSACTIONS"

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Recognizing the need to enhance flexibility and reduce the burden of Government-funded science and technology contracts, Congress crafted Section 845 Other Transaction Authority (OTA) to release Defense Advanced Research Projects Agency and the Services from complying with statutes and regulations in the FAR/DFARS procurement process. This greater flexibility was intended to attract commercial firms that normally would not do business with the Government, thus expanding the defense technology and industrial base. This study was conducted to identify and develop appraisal metrics that could be used to measure both the use and value of Section 845 OTs. The thesis also presents a survey of standard contract management metrics used by various buying organizations. The researcher found survey respondents rated 13 standard contract metrics to be appropriate for Section 845 OTs; and, recommends establishing four measures to serve as a core set of metrics applicable to all Section 845 OTs.

**DoD KEY TECHNOLOGY AREA:** Other (Acquisition, Contracting)

**KEYWORDS:** Section 845, Other Transactions, Contract Metrics, Metrics

### **SIMULATION OF KOREAN FLAG SHIPPING (KFS) IN SUPPORT OF ASSAULT FOLLOW-ON ECHELONS AND FOLLOW-UP SHIPPING**

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Ira Lewis, Department of Systems Management**

Sealift is essential in the defense of the Korean peninsula. Military Sealift Command (MSC) has established a Memorandum of Agreement (MOA) with the Republic of Korea (ROK) in which Korean merchant vessels could be utilized in the movement of military cargo from the U.S. and the Pacific region to Korea. The complexity involved in activating, assigning ships and ensuring adequate sealift, merits analysis to better understand this MOA.

This thesis focuses on the activation and assignment of Korean vessels enrolled in the Korean Flag Shipping (KFS) program. A baseline analysis of the ship data was conducted in order to determine which inputs were available to model. A simulation model based on ship routes, capacities, speed, and location was developed to provide a decision framework for MSC. Hypothetical unit data was created with the intent of demonstrating how shipping response times can be generated based on known probabilities from the baseline. Unit closure times are also predicted. We did not use actual operation plan data in the development of this simulation. However, the substitution of actual unit movement data was anticipated and the model was verified to ensure that it could accommodate this requirement.

This research provides a foundation for future simulation of the KFS program. Results indicate that the response times are longer than those currently used. The variability found in both the response times and unit closure times is sensitive not only to the size of the unit to be moved but also to the location of the ship, travel distances and the allocation of the ships.

**DoD KEY TECHNOLOGY AREA:** Modeling and Simulation

**KEYWORDS:** Simulation, Korean Flag Shipping, OPLANS, Agreements, Marine Transportation, Military Sealift Command, Logistics

### **A REVIEW OF CONTRACTOR LOGISTICS SUPPORT FOR THE MAINTENANCE OF THE NAVY'S T-45 TRAINING SYSTEM (T45TS)**

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**Master of Science in Management-June 2000**

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This thesis evaluates the effects Contractor Logistics Support (CLS) has had on the Navy's T-45 Training System (T45TS). This objective was accomplished by examining maintenance support for the T45TS using technical, functional, and operational analysis to determine the impact contractor provided support has had on the program. Research included a review of CLS within the Department of the Navy (DON), review of the overall T45TS acquisition strategy, review of contracting vehicles used in support of the T45TS, and identification of metrics used to determine quantifiable improvements attributable to the use of Contractor Logistics Support. After completing analysis of the interviews and literature, recommendations are presented on key factors to consider when determining to use contractor provided logistics in support of current and future weapon systems.

**DoD KEY TECHNOLOGY AREA:** Other (Acquisition)

**KEYWORDS:** Contractor Logistics Support, CLS, Maintenance Outsourcing, Privatization, T-45 Training System, T45TS



### **FORECASTING MV-22 AERIAL REFUELING TRAINING MISSIONS FOR 2D MARINE AIRCRAFT WING**

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**Master of Science in Management-December 1999**

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The MV-22 "Osprey" was designed as a "medium-lift" replacement for the Marine Corps CH-46E "Sea Knight" and CH-53D "Sea Stallion" helicopters. The MV-22's tilt-rotor technology will allow it to exploit the operational envelopes of both helicopters and turbo-prop aircraft. This expanded performance envelope, along with the capability to conduct aerial refueling, will allow a MV-22 lifted force to influence future operations through an increase in range and speed.

This thesis quantifies the impact that fielding the MV-22 within the 2nd Marine Aircraft Wing (MAW) will have on its KC-130 squadrons. This impact arises from the MV-22's capability to receive fuel in-flight (aerial refuel). Since the CH-46E and CH-53D could not aerial refuel, their pilots did not have a need to conduct aerial refueling training, and thus they had no demand for "tanker" support from the KC-130 squadrons. Now that the MV-22 pilots will be required to train for aerial refueling operations, KC-130 squadrons will be required to provide "tanker" support for them.

This research quantifies the future increase in demand in terms of aerial refueling missions and offers recommendations to reduce it. For 2nd MAW, this increase will peak in FY02 with 164 missions being "scheduled."

**DoD KEY TECHNOLOGY AREA:** Air Vehicles

**KEYWORDS:** Aircraft, MV-22, Aerial Refueling, KC-130

### **THE USE OF ADVANCED WARFIGHTING EXPERIMENTS TO SUPPORT ACQUISITION DECISIONS**

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**Master of Science in Management-December 1999**

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Susan P. Hocevar, Department of Systems Management**

This research effort focused on the use of Advanced Warfighting Experiments (AWEs) to support acquisition decisions. Specifically, the thesis evaluated the effectiveness of the Army Task Force XXI AWE in providing information to support investment decisions and refinement of requirements for information age technologies. A detailed analysis of the 1997 Operational Test and Evaluation Command (OPTEC) Live Experiment Assessment Report identified program developmental recommendations. Data were collected from appropriate program offices and user representatives to determine the perceived utility of the recommendations and level of implementation. Qualitative data detailing why specific recommendations were or were not implemented were used to determine the contributing factors to a program's ability to benefit from participation in the experiment. Overall, fifty-two percent of the OPTEC recommendations were reported as either fully or mostly implemented. Other potential benefits of AWE participation were identified to include: (1) marketing and exposure of program, (2) refinement of user requirements, and (3) information on integration, interfaces, and interoperability. Risks from participation in the AWE included: (1) a poor return on investment, (2) potential negative exposure, and (3) extensive changes in requirements. Recommendations to enhance the value of participation in AWEs are included.

**DoD KEY TECHNOLOGY AREA:** Other (Acquisition)

**KEYWORDS:** Advanced Warfighting Experiments, Task Force XXI, Joint Venture, Army Digitization, Acquisition Management

### **INDONESIAN FINANCIAL CRISIS: CAUSES AND REMEDIES**

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**Master of Science in Management-June 2000**

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**James M. Fremgen, Department of Systems Management**

In 1997 Indonesia experienced a severe financial crisis due to problems in its banking system. The central objective of this study is to analyze the Indonesian government's banking system policies, identify the causes of the financial crisis and analyze the government's efforts in response to the crisis. This thesis investigates the government's policies and its efforts in reviving the banking sector by using archival research, as well as a literature search of books, magazine articles, Internet articles, newspaper articles, and other library information sources. A program of recapitalization and restructurization of the banking system was a prime factor in the economic recovery in Indonesia. One lesson learned was that the central bank, as the monetary authority was not free from external pressure, especially from the government. As a result, policies were adopted to respond to immediate problems as they arose, without consideration of broader economic consequences, which in turn created other unforeseen problems. When a new Indonesian government rose to power, it improved the legal foundation of the monetary authority to make decisions, by clarifying its power and duties, and protecting it from external intervention or pressures. The monetary authority now has the independence and power to implement policies based on sound economic principles.

**DoD KEY TECHNOLOGY AREA:** Other (Indonesian Financial Crisis: Causes and Remedies)

**KEYWORDS:** Indonesian Financial Crisis in 1997

### **A MODEL OF CONTRACT ADMINISTRATION FOR THE ARMED FORCES OF THE PHILIPPINES (AFP) MODERNIZATION PROGRAM**

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**CDR David A. Smith, USN, Department of Systems Management**

The purpose of this thesis is to determine and develop the appropriate system for the implementation and administration of contracts formulated under the Armed Forces of the Philippines (AFP) Modernization Program. In 1995, the Philippine Congress mandated the modernization of the AFP through a 15-year program under Republic Act (RA) 7898. Subsequently, the Department of National Defense (DND) issued Circular No. 29 to implement the Act. The Circular provided adequate guidance for the conduct of major system contracting, but it did not elaborate on the post-award implementation and administration of AFP contracts. Contract administration is a vital process in government acquisitions; it ensures the successful completion of the contract according to the satisfaction of the parties involved. Without a functioning contract administration system, the AFP risks failure in its Modernization Program. The study identified 12 post-award issues that would affect the successful administration of AFP contracts. Most of the issues are typical of any contracting agency, but some like countertrade, technology transfer, the Bids, Awards and Negotiation Committee (BANC) and the Project Management Teams (PMT), and lack of oversight skills and resources are unique to the AFP context. Using the AFP post-award issues, the prevailing contract administration practices and trends, and other concerns unique to the AFP, the study developed a model of contract administration that incorporates the elements and characteristics essential for its application in the AFP acquisition and contracting environment.

**DoD KEY TECHNOLOGY AREA:** Materials, Processes, and Structures

**KEYWORDS:** Contract Administration, AFP Modernization Program

### **IMPLEMENTATION OF TOTAL QUALITY LEADERSHIP IN THE TURKISH ARMY ACADEMY**

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Gail F. Thomas, Department of Systems Management**

Total Quality Leadership (TQL) activities commenced in the Turkish Army Academy in early 1997. This thesis investigates the current implementation status of TQL in Turkish Army Academy through a TQL Climate Survey and interviews. The data suggest that while quality is important to the Academy, the officers are not confident that the TQL program will help them achieve it. The compatibility of the TQL philosophy with Turkish Army Academy is discussed. Recommendations are also provided.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Total Quality Leadership

### **A STUDY OF FLEET SURGICAL TEAMS READINESS POSTURE IN AMPHIBIOUS READINESS GROUPS**

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**Master of Science in Management-March 2000**

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This thesis describes and evaluates Fleet Surgical Teams (FSTs). It examines how Navy Medicine adapted FSTs to changing support requirements associated with the Total Health Care Support Readiness Requirement (THCSRR) and its deployability posture in Amphibious Readiness Group (ARG) contingency taskings. The FSTs are dedicated medical and surgical assets assigned to the Fleet Commanders-in-Chief (CINC) to increase efficiencies in meeting mission readiness requirements. The FSTs' medical readiness was evaluated against Status of Resources and Training System (SORTS) criteria that included personnel, training, equipment, supplies, and fleet support operations. The SORTS streamlined resource tracking and reporting to improve FST's capability in delivering continuum of healthcare for the Operating Forces. The analysis showed no glaring deficiencies and determined that FSTs contribute positively to overall ARG medical readiness by increased efficiencies through consolidating and integrating Navy and Marine Corps medical units' support capabilities. The Commander, Amphibious Task Force (CATF) Surgeon must continue to monitor both FST and ARG medical readiness, and pay particular attention to the ship's medical department Authorized Minimal Medical Allowance List (AMMAL) inventory levels.

**DoD KEY TECHNOLOGY AREA:** Other (Medical Readiness, Medical Response Teams)

**KEYWORDS:** Forward Deployed Naval Forces Surgical Teams

### **ANALYSIS OF HOW THE WORK BREAKDOWN STRUCTURE CAN FACILITATE ACQUISITION REFORM INITIATIVES**

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Program Managers (PMs) need insight into the high-risk and high-cost elements of their programs to

effectively manage them. The Department of Defense (DoD) has adopted several acquisition reform initiatives in order to become a smarter, more efficient, and more responsive buyer of goods and services that meet our warfighter's needs. DoD 5000.2-R Regulation requires PMs to tailor a work breakdown structure (WBS) for each program using the guidance in Military-Handbook-881 (MIL-HDBK-881), "DoD Handbook - Work Breakdown Structure." This research concludes that a WBS structured in accordance with MIL-HDB-881 can significantly impede implementation of DoD acquisition reform initiatives. It does not adequately identify the key products and processes essential for program success. An alternate method of constructing a WBS was developed which better identifies and differentiates key products and processes. This research concludes that the alternate WBS has the potential to significantly facilitate implementation of recent DoD acquisition reform initiatives, as well as the potential to provide PMs greater visibility and early identification of cost, schedule, performance, and risk issues using an Earned Value Management System (EVSM).

**DoD KEY TECHNOLOGY AREA:** Other (Acquisition Management)

**KEY WORDS:** Acquisition Reform, Program Management, Work Breakdown Structure (WBS), Acquisition Process, Systems Acquisition, Integrate Product and Process Development, Integrated Product Teams (IPT), Earned Value Management System (EVMS)

**TEACHING TOMORROW'S LEADERS: A COMPARISON OF LEADERSHIP DEVELOPMENT  
AT THE UNITED STATES MILITARY ACADEMY AND UNITED STATES NAVAL ACADEMY**

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**Master of Science in Leadership and Human Resource Development-June 2000**

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**Gail F. Thomas, Department of Systems Management**

This thesis describes the different methods used to teach leadership to cadets at the United States Military Academy and Midshipmen at the United States Naval Academy. Based on historical information and interviews with Cadets and Midshipmen and the faculty and administrators at each institution, this thesis explains how the respective philosophies have developed and influenced the current approach to leadership development, how the effectiveness of the leadership curriculum is measured, and discusses the future development of the leadership programs. Finally, this thesis provides recommendations to enhance the leadership development programs at each academy.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Military Leadership, Education

**RIGHTSIZING DOD INVENTORY: A CRITICAL LOOK AT EXCESSES, INCENTIVES AND  
CULTURAL CHANGE**

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In its report "Major Management Challenges and Program Risks: Department of Defense," (GAO/OCG-99-4, January 1999), the Government Accounting Office (GAO) reported that half of the Department of Defense's (DOD) \$69.9 billion in inventory was either obsolete or rarely used. GAO then asserted that DOD would be able to reduce its inventory of secondary items and develop a culture of economic and efficient inventory management if DOD inventory management personnel were trained in modern commercial logistics practices. This thesis presents the position that high inventory levels can be the result of outdated performance measures and reward systems that often encourage holding high levels of

inventory. Included is a description of performance measures used for Item Managers, Inventory Managers and unit commanders and their staffs as well as a discussion of other systemic factors that impact inventory levels and may result in excess inventories. In addition, this thesis suggests that some modern commercial logistics practices have been successfully implemented by DOD for certain commodities, while for others, it may not make sense to do so.

**DoD KEY TECHNOLOGY AREA:** Other (Logistics)

**KEYWORDS:** Logistics, Inventory, Performance Measures

### **COST-EFFECTIVE ALTERNATIVES FOR DISPOSAL OF OBSOLETE NAVY PERSONAL COMPUTERS**

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The Department of the Navy (DoN) disposes of large quantities of obsolete personal computers (PCs) annually. The methods of disposal are well regulated and predictable. There seems to be little concern, however, for the financial implications of such practices and if cost-effective uses exist for obsolete PCs. With initiatives to put *new* computers in the hands of DoN employees, no initiatives were discovered that make use of *used* PCs to help meet the need.

This thesis explores disposal procedures for obsolete DoN computers and examines if cost-effective alternatives exist. The pending Navy/Marine Corps Intranet (NMCI) initiative is examined (along with PC leasing) since computer disposal could be a significant factor in the annual cost of NMCI.

Major conclusions: A PC disposal problem will exist under NMCI, existing regulations do not expedite putting used PCs in the hands of DoN employees and there may be uses for obsolete PCs in Navy recruiting efforts.

Major recommendations: Selling or giving obsolete NMCI PCs to DoN employees thereby reducing the cost of NMCI, an interim suggestion to modify our disposal procedures to include PC issue to DoN employees, suggestions for Navy Recruiting to give used PCs to Delayed Entry Program personnel.

**DoD KEY TECHNOLOGY AREAS:** Computers and Software, Command, Control, and Communications, Manpower, Personnel, and Training, Other (Acquisition Reform, Materiel Disposal Practices)

**KEYWORDS:** Computer Disposal, Computer Re-use, Computer Leasing, PC Disposal, Navy/Marine Corps Intranet

**AN ANALYSES OF INTERNET/INTRANET INFORMATION SYSTEM ARCHITECTURES  
WITH ORACLE 8i FOR TURKISH NAVY**

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**Master of Science in Computer Science-March 2000  
and**

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**Master of Science in Information Technology Management-March 2000**

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Turkish Navy has made a strategic commitment to Oracle DBMS, by making an enterprise contract with Oracle Corporation, which places Oracle DBMS at the heart of all information processing in Turkish Navy. Ten years later currently established Oracle DBMS based information systems will be legacy systems and Turkish Navy will be bound to under Oracle proprietary lock-in, unless careful approach in deploying these new systems is not made.

Oracle 8i is the latest version of the Oracle Corporation's DBMS can be solution to this problem. With Oracle 8i's Java-enabling components-Object Request Broker (ORB), Java Virtual Machine (JVM), and embedded JDBC Driver- Turkish Navy have a wealth of technologies at its disposal. Turkish Navy has a choice of several programming models - PL/SQL, JDBC, SQLJ, CORBA, and EJB; and a choice of protocols - Net8 and CORBA-IIOP. Selecting model over another can be a daunting and very important task. Each model has strengths and weaknesses for a particular task.

This research surveys Oracle Java Platform and researches different development architectures with their pros and cons, and points out the direction that should be taken in order to ensure scalability, maintainability, interoperability and extensibility of the future systems which will prevent the proprietary lock-in of the certain vendors and their products.

**DoD KEY TECHNOLOGY AREAS:** Computing and Software, Other (Information System Management)

**KEYWORDS:** Oracle, Oracle 8i, Enterprise Java Beans, CORBA, Information System Architectures, Microsoft vs. Oracle, Turkish Navy, EJB, Java, PL/SQL

**AN ANALYSIS OF THE EFFECTS OF PARTICIPATION AND PERSEVERANCE IN HIGH  
SCHOOL NON-ATHLETIC EXTRA-CURRICULAR ACTIVITIES ON THE ASCENT TO  
HIGHER LEADERSHIP POSITIONS AT THE U.S. NAVAL ACADEMY**

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This thesis attempts to answer the following research questions: (1) Does participation or perseverance in non-athletic extra-curricular activities in high school (defined as attaining membership or persisting in the same activities throughout high school) result in better leadership performance at the Naval Academy? (2) Can a measure be devised to predict leadership performance at the U.S. Naval Academy based on demonstrated participation and perseverance in high school non-athletic extra-curricular activities? To analyze these questions, a quantitative analysis of the Naval Academy classes of 1994 through 1998 is undertaken to determine if there is a significant relationship between perseverance in extra-curricular activities in high school and leadership ascent at the Naval Academy.

**DoD KEY TECHNOLOGY AREA:** Manpower, Personnel, and Training

**KEYWORDS:** Leadership, Training, Recruitment, Naval Academy

### **AN ANALYSIS OF DECISION MAKING STRATEGIES USED BY P-3 PILOTS IN HAZARDOUS SITUATIONS**

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Effective decision making in aeronautical environments, which often involves high elements of risk, is critical to mission success. Unfortunately, no proven methodology exists to train pilots to make successful decisions. Cockpit decision making has relied on traditional analytical models and methodologies that underestimate the role of pilot experience, expertise and judgment. Naturalistic Decision Making (NDM) models contend that decision makers facing real-world decisions use experience and judgment to make timely decisions without analyzing a multitude of alternatives.

This thesis analyzes 438 P-3 aviation hazard reports (HAZREP) to ascertain which cognitive strategies from either the analytical or naturalistic methodology are more appropriate for handling malfunction situations. The author presents a hybrid model of decision making by P-3 pilots based on the results of the analysis and strategies from both methodologies.

This thesis recommends that decision making training be treated as a core activity of pilots not only in flight school, but after qualification is complete. Training pilots to become experts will improve situational awareness and reduce the number of unfavorable outcomes in hazardous situations.

**DoD KEY TECHNOLOGY AREAS:** Computing and Software, Manpower, Personnel, and Training, Air Vehicles

**KEYWORDS:** P-3 Aviation Hazard Report (HAZREP), Aeronautical Decision Making, Naturalistic Decision Making (NDM), Analytical Decision Making (ADM), Situational Awareness, Expert Behavior

### **THE ASHORE INFRASTRUCTURE REQUIREMENTS NEEDED TO SUPPORT MOBILE MAINTENANCE FACILITIES (MMF) FOR INTERMEDIATE MAINTENANCE ON THE NEXT GENERATION AIRCRAFT CARRIER (CVNX)**

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**Donald R. Eaton, Department of Systems Management**

Intermediate Level Aviation Mobile Maintenance is currently conducted by the United States Marine Corps (USMC), Marine Aviation Logistics Squadrons (MALS) and also the USMC and United States Navy (USN) Electronic Warfare Community using a type of Mobile Facility (MF). The system is designed to be flexible and adaptable to changing mission requirements. This thesis investigates whether the same type of system could be utilized on the next generation aircraft carrier (CVNX).

The shipboard and ashore locations for the MF are investigated and the appropriate time to move them ashore as well. The proposed system is examined from an ashore perspective, and the infrastructure required to support the MF when offloaded from the aircraft carrier identified. The responsibility, transportation, site plan, complexing, power requirements, and manning issues are each addressed for the proposed system.

The analysis of the proposed system reveals that the costs associated with: procurement, configuration, transportation, ancillary gear, and maintenance to implement the proposed system are quite

large. Also, the manning at both the shipboard and ashore commands would need to adjust as well. The changes required to execute the proposed system would require extensive investment and the return on this investment would not be realized until all aircraft carriers had implemented the proposed system.

**DoD KEY TECHNOLOGY AREA:** Other (Aviation Intermediate Mobile Maintenance)

**KEYWORDS:** Mobile Facility, Intermediate Maintenance, CASS, Modularization, CVNX

**APACHE PRIME VENDOR SUPPORT (PVS): A CASE STUDY OF IMPLEMENTING THE PVS INITIATIVE WORLD WIDE IN SUPPORT OF THE AH-64 APACHE HELICOPTER**

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In 1998, the AH-64 Apache helicopter sustainment was the most expensive in the Army and the sixth most expensive in DoD. Apache represented 22% of the Army Working Capital Fund expenditures and accounted for \$50-\$60 million in Army Material Command (AMC) sustainment expenditures. Because of the overwhelming sustainment costs, Apache modernization programs remain unfunded.

Between 42% and 49% of Apache sustainment costs funded AWCF and AMC overhead costs and Apache units would typically pay 45% to 50% above the actual repair parts acquisition costs. Neither the Army's wholesale supply system nor the repair parts contractors currently have any incentive to improve reliability as the wholesale supply system is supported through surcharges on the parts and the contractor makes more profit by selling the Army more parts.

Under acquisition reforms, a Prime Vendor Support (PVS) sustainment program has been proposed and evaluated. The PVS concept fixes sustainment costs per flying hour and incentivizes the contractor to improve reliability and readiness as profits are increased. PVS also has the added capability to modernize the Apache and its systems at no extra cost to the Government.

This thesis is undertaken to analyze and document the Army's PVS sustainment program and recommend its implementation.

**DoD KEY TECHNOLOGY AREAS:** Air Vehicles, Other (Procurement)

**KEYWORDS:** Prime Vendor Support, PVS, Sustainment, Performance Based Logistics (PBL), Life Cycle Cost

**THE ROLE OF U.S. MARITIME POLICY IN STRATEGIC SEALIFT**

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Strategic sealift is essential to the Department of Defense (DoD) for it to carry out its national security mission. Surge sealift is provided primarily by DoD's organic fleet. Sustainment sealift is accomplished through chartering commercial ships. U.S. maritime policy places the primary requirement for sustainment sealift on the U.S. maritime industry. Policies dating to the 1920s attempt to ensure an adequate number of ships by providing operating subsidies and cargo preference. Despite these policies, the size of the U.S. commercial fleet has declined. DoD uses foreign flag ships to meet its needs when U.S. flagged vessels are not available. Foreign flag ship use is significant and presents risk to the conduct of military operations. The world maritime industry has undergone significant change. The rise of flags of convenience and open registries has altered the industry. This thesis reviews U.S. maritime policy, DoD's requirement for sealift and options for obtaining sealift. It identifies and explores the nature of the risk related to strategic sealift



facing the DoD as it enters the 21<sup>st</sup> century and suggests that the risk associated with the use of foreign flag vessels is low.

**DoD KEY TECHNOLOGY AREA:** Other (Sealift)

**KEYWORDS:** Strategic Sealift, U.S. Maritime Policy, Risk Assessment

**BUSINESS STRATEGIC MANAGEMENT AND THE U.S. MARINE CORPS: AN ANALYSIS  
OF THE APPLICABILITY OF SELECTED CONCEPTS**

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This thesis discusses the applicability of three selected business strategic management concepts within the United States Marine Corps at the battalion level of command. The study includes a review of forty strategic management concepts, the identification of fifteen recent developments, and the rationale behind the selection of the three concepts used in this study. The three concepts are: Core Competence Leadership, Scenario Planning and Strategic Intent. Field research consisted of telephone interviews with twelve Marine Corps leaders to discuss applicability of these three concepts at the battalion level of command. The Marine leaders interviewed are not identified in the thesis, but their comments are recorded in the raw data appendix. Overall, of the three concepts, only Core Competence Leadership was found to be applicable at the battalion level of command. In general, the Marine leaders interviewed felt the three concepts were either a higher headquarters function, or already covered under current Marine Corps leadership practices. Further research to examine the potential benefits of a Core Competence approach to leadership within the Marine Corps is recommended.

**DoD KEY TECHNOLOGY AREA:** Other (Strategic Management)

**KEYWORDS:** Strategic Management, Planning, Core Competence

**ESTIMATING OPERATING AND SUPPORT COST MODELS FOR  
U.S. AIR FORCE AIRCRAFT**

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Special Abstract text: The USAF Visibility and Management of Operating and Support Cost (VAMOSOC) system is an information system which reports historical O&S costs of Air Force weapon systems. Source data for VAMOSOC comes from a number of USAF financial, logistics, inventory, and operating systems. This thesis examined VAMOSOC data and earlier analysis that flyaway costs, flying hours, number of aircraft, and fleet age were important variables for explaining O&S Costs.

**DoD KEY TECHNOLOGY AREA:** Other (Operating and Support Cost)

**KEYWORDS:** Operating and Support Cost, Readiness, Flyaway Cost, Flying Hours

**COMPARISON OF EXPERT JUDGMENT METHODS USED FOR MODERNIZATION  
DECISION: THE CASE OF MIG-29**

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This research analyzes two approaches to the economic evaluation of an aircraft modernization program. The Analytic Science Corporation (TASC) method is compared with the Logical Decision for Window (LDW) methodology. TASCFORM-AIR model is a method to quantitatively measure military force modernization. Logical Decisions for Windows software and methodology is based on Multiattribute Utility Theory. It also helps to evaluate decisions quantitatively.

The research includes analysis of the reasons, constraints and tendencies in the modern aircraft modernization process. Weapon modernization is usually driven by several objectives, all of them in one way or another are pertinent to resource allocation. Reliable analytical tools are important to make good decision. Cost-effectiveness and cost utility approaches are evaluated.

Comparison of both methodologies is based on the MiG-29 modernization situational model. TASCFORM-AIR Model provides static indicators of military force potential. This can be viewed as measures of effectiveness. The LDW program computes the alternatives' utility by combining its measure levels based on the analyst's preferences. The results produced in both cases are useful in several ways. They are indicators, however indicators rather than "answers" to the decision making problem.

**DoD KEY TECHNOLOGY AREA:** Other (Military Economic Analysis)

**KEYWORDS:** Aircraft Modernization, Expert Judgment Method, Cost-Effectiveness, Cost-Utility, MiG-29

**COST BENEFIT ANALYSIS OF MONTEREY PINES GOLF COURSE**

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With the option of playing two PGA "championship" golf courses for nearly the same price as the local MWR golf course, servicemembers are questioning the value of Monterey Pines Golf Course, the government-operated course in the Monterey area.

The main purpose of this thesis is to examine the costs and benefits of having a government-operated course in Monterey, where the golf market is extremely competitive, and to examine alternatives to improve the course in terms of value and quality to the servicemember.

The research conducted first focused on gathering information through a questionnaire survey about the current state of Monterey Pines, from the eyes of the customer who plays the course. Research then focused on collecting and comparing operating and financial data from Monterey Pines with similar data from Bayonet and Black Horse Golf Courses. Finally, the study moved to examining the costs and benefits of three approaches to improving the course--one of which was a joint public/private venture similar to Bayonet and Black Horse in structure.

In conclusion, it was found that the course needs improvement or it will continue to face losing its military customer base. The three alternatives for improvement were all determined feasible, but strategic considerations of Monterey Pines' long-term market position will be necessary to make a final decision on improvements.

**DoD KEY TECHNOLOGY AREA:** Other (Financial Management)

**KEYWORDS:** Cost Benefit Analysis, Financial Management, Public/Private Ventures

**BUSINESS WARGAMING: APPLICATIONS FOR MARINE CORPS MANPOWER  
POLICY DECISIONS**

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Complexity is abundant in nature, in society, and in the workplace. The business sector has recently experimented with business wargaming, which is based upon complex adaptive systems theory, as a tool for policy analysis and management training. Business wargames, based upon agent-based simulation technology, provide a flexible platform using software agents that are programmed with simple rules, interact with each other and their environment. This interaction leads to emergent behavior, which evolves from the collective interaction and adaptation of these agents. This thesis discusses the experiences and lessons learned from the U.S. Army's Firm Handshake Proof of Principle business wargame, and applies them to a Marine Corps' counterpart game called SmMarineCorps. SimMarineCorps will model the Marine Corps' Human Resource Development Process (HRDP). This architecture consists of players, screens, agents, rules of engagement, and relationships among and between the players and agents. Critical success factors for SimMarineCorps is General Officer support to ensure that the necessary data/metrics are collected and validated.

**DoD KEY TECHNOLOGY AREAS:** Human Systems Interface, Manpower, Personnel, and Training, Modeling and Simulation

**KEYWORDS:** Manpower, Manpower Policy, Business Wargaming, Simulation, Agent Based Simulation, Complexity, Complexity Theory